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# FLIGHT and The AIRCRAFT ENGINEER

*First Aeronautical Weekly in the World : Founded 1909*

*Editor* C. M. POULSEN

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*Chief Photographer* JOHN YOXALL

Editorial, Advertising and Publishing Offices: DORSET HOUSE, STAMFORD STREET, LONDON, S.E.1
Telegrams: Truditur, Sedist, London. Telephone: Waterloo 3333 (35 lines).

COVENTRY: 8-10, CORPORATION ST. *Telegrams:* Autocar, Coventry. *Telephone:* Coventry 5210.

BIRMINGHAM, 2: GUILDHALL BUILDINGS, NAVIGATION ST. *Telegrams:* Autopress, Birmingham. *Telephone:* Midland 2971 (5 lines).

MANCHESTER, 3: 260, DEANSGATE. *Telegrams:* Iliffe, Manchester. *Telephone:* Blackfriars 4412.

GLASGOW, C.2: 26B, RENFIELD ST. *Telegrams:* Iliffe, Glasgow. *Telephone:* Central 4857.

*Registered at the G.P.O. as a Newspaper.*

No. 1791. Vol. XLIII — April 22nd, 1943. — Thursdays, One Shilling.


# The Outlook

## The Mediterranean Command

THIS is a curious war. It started with no fixed principles for the use of the two latest weapons, tanks and aircraft, and these are gradually being evolved by trial and error. The Germans used one method in Poland and in France with success, and some military writers jumped to the conclusion that tactical rules for these two weapons had been established. At Alamein General Montgomery reversed the German practice of using his armour to lead an attack, and sent infantry and engineers in front of it. Now the methods of organising aircraft are also in the melting pot.

A thoughtful Czech writer, Capt. F. O. Miksche, two of whose books have recently been reviewed in *Flight*, gave it as his opinion that an Air Force in which a sharp division is drawn between Fighter and Bomber Commands can never lend the ground forces the total support which is essential to victory in modern battle. That division existed only in Britain, and our reviewer pointed out that when a British land force was engaged overseas, as in France and the Middle East, one A.O.C.-in-C. controlled all the squadrons of bombers and fighters alike.

Now in North Africa a tendency appears to revert to something like the original divisions which still prevail in Britain. The British, United States and French squadrons have been pooled, and redivided into Tactical, Strategical and Coastal Air Forces, and the Western Desert Air Force which has accompanied the Eighth Army has been incorporated in the Tactical Air Force, but remains an entity under A.V-M. Broadhurst. (An exclusive illustrated article on the organisation and the system of Army-Air Co-operation in the Western Desert was published in *Flight* of October 22nd, 1942.)

The general organisation of the three N.W. African Forces is not on all fours with the Commands in Britain, for it is recognised that everywhere fighters are necessary to secure air superiority, unless heavy bombers are able to defend themselves. Nor is the Strategical Force quite comparable to Bomber Command, for its objectives are more limited and are designed to have a direct bearing on the land campaign in Tunisia. It strikes at enemy bases and at lines of communication as far away as possible, and it works definitely to help the Allied Army and Navy, not regarding action independent of those two as the only form of strategic bombing.

The Tactical Force includes fighters and light bombers, and, of course, reconnaissance aircraft. North Africa has started a novel and interesting organisation, which perhaps will be copied by Army Co-operation Command when Europe is again invaded from the British Isles.

The constitution of the Mediterranean Command under Air Chief Marshal Sir A. Tedder, with the Middle East, Malta and N.W. Africa as three subordinate Commands, is a logical recognition of conditions which have existed in practice for some time past.

## General MacArthur's Views

THE Commander-in-Chief in the South-West Pacific, Gen. MacArthur, has made a statement on the situation there. It is without doubt a masterly exposition, but it calls for careful reading and study. It is possible that a cursory perusal might give the impression that Gen. MacArthur set little store by sea power, although he paid a handsome verbal tribute to the naval forces of the Allies. The reader needs to give full weight to the limiting expressions used by the

General if he would avoid arriving at erroneous conclusions about the General's views.

It has several times been remarked in *Flight*'s weekly commentary on the "War in the Air" that Gen. MacArthur has invented the tactics of defence by bomber. The General himself in his statement used the striking epigram: "The first line of Australia's defence is our bomber line." The expressions which might give the erroneous idea that he depreciated sea power are: "The Japanese, except for our submarine activities, which are not to be discounted, have complete control of the sea lanes in the Western Pacific and of the outer approaches to Australia. The control of such sea lanes no longer depends solely, or even perhaps primarily, on naval power, but on air power operating from land bases held by ground troops or supported by naval power. . . . If we lose in the air, our naval forces cannot save us. . . . Japanese naval forces in great strength, though now beyond our bomber range, are within easy striking distance of Australia . . . the battle for the Western Pacific will be won or lost by the proper application of the air and ground team."

These words do seem at first sight to depreciate Allied naval power, while admitting a fear of Japanese sea power if the command of the air were lost. The last sentence in particular rather smacks of a dangerous generalisation; but attention must be concentrated on the word "Western." Gen. MacArthur has not been entrusted with the task of winning the coming Battle of the Pacific, but only with the holding of the Japanese in the Western Pacific (South-Western would be more precise) and defending Australia until the United Nations have their hands free for a final victorious offensive against Japan. That offensive, we believe, will take the form of land-air in Burma and China and sea-air for the rest. The grand strategy must be to defeat the Japanese battle fleet, and then all the tentacles of the octopus must wither.

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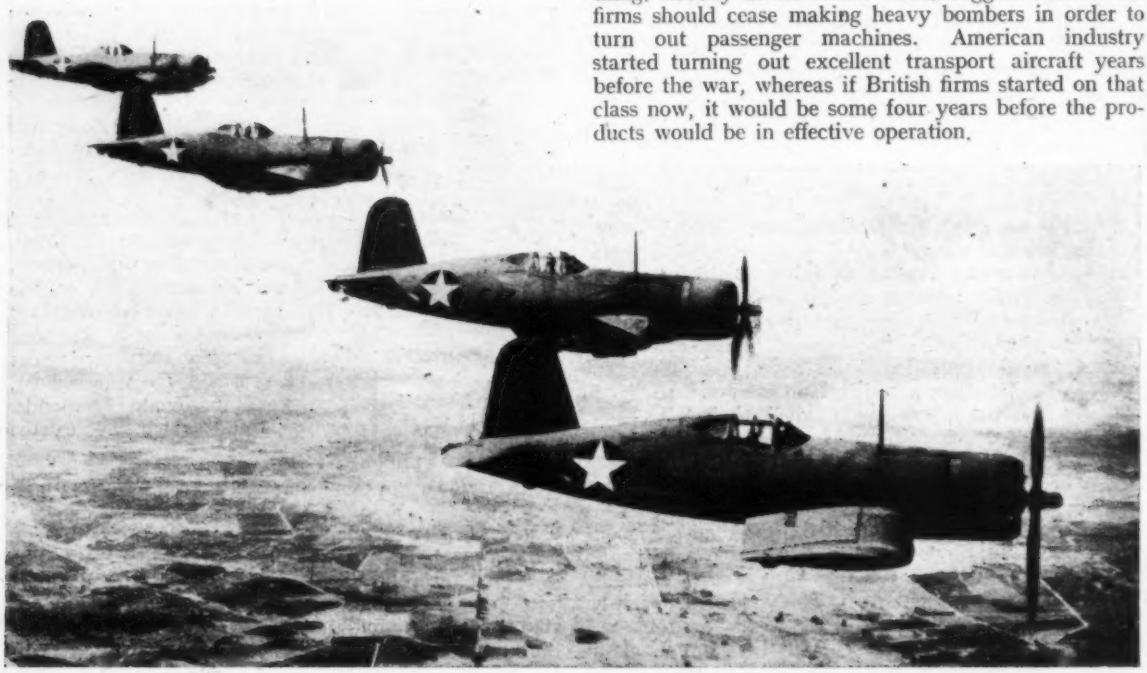
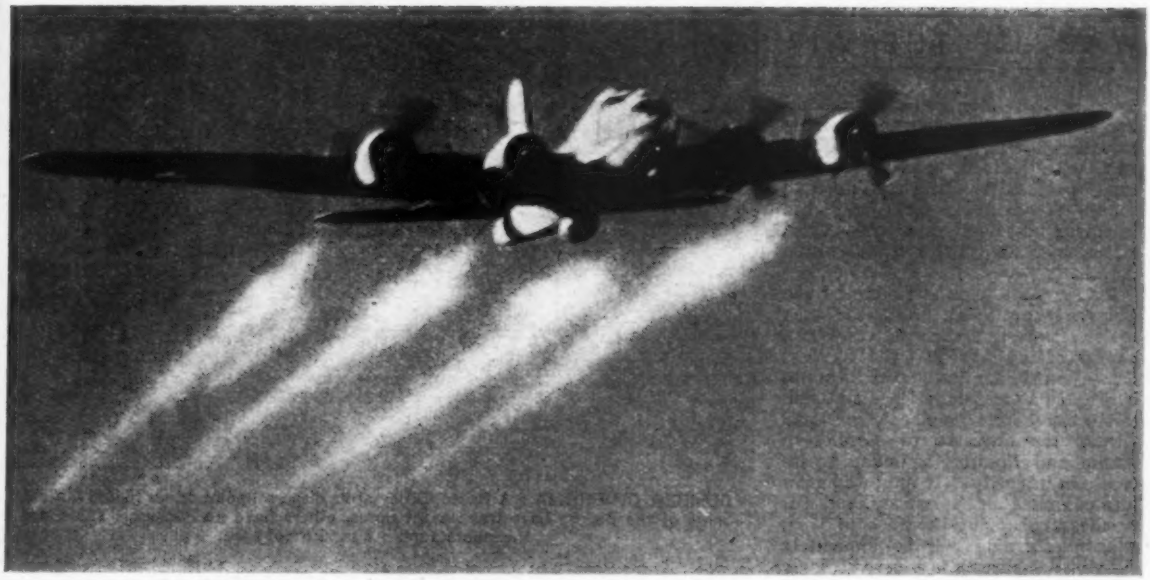
## Platitudes

A MEETING of the Institute of Export was held in London last week with the intention, apparently, of waking up the Government and the public to the necessity of preparing for a large development of British air transport after the war. The intention was excellent, and most of the speakers voiced irreproachable sentiments about the desirability of planning ahead, and so on—all of which has been said over and over again in the pages of *Flight* and elsewhere. The result was what is colloquially called a "flop."

Behind all the talking lies the fear that American companies will be able to monopolise most of the world's air routes after the war. They have designed various types of transport aircraft which are suitable for the work, while Britain has unfortunately neglected that class. That state of affairs is not to be altered within any time which the war may conceivably last. For one thing, nobody in his senses would suggest that British firms should cease making heavy bombers in order to turn out passenger machines. American industry started turning out excellent transport aircraft years before the war, whereas if British firms started on that class now, it would be some four years before the products would be in effective operation.



**VERY FLEET FIGHTERS: A formation of Vought-Sikorsky F4U-1 Corsairs. The 2,000 h.p. Double Wasp engine puts the Corsair into the modern 400 m.p.h.-plus category. A number of them have already been in action against the Japanese.**



**TRAILS IN THE MAKING :** Separate condensation trails coming from the four engines of a U.S. Eighth Army Air Force Fortress at 22,000ft.

# WAR in the AIR

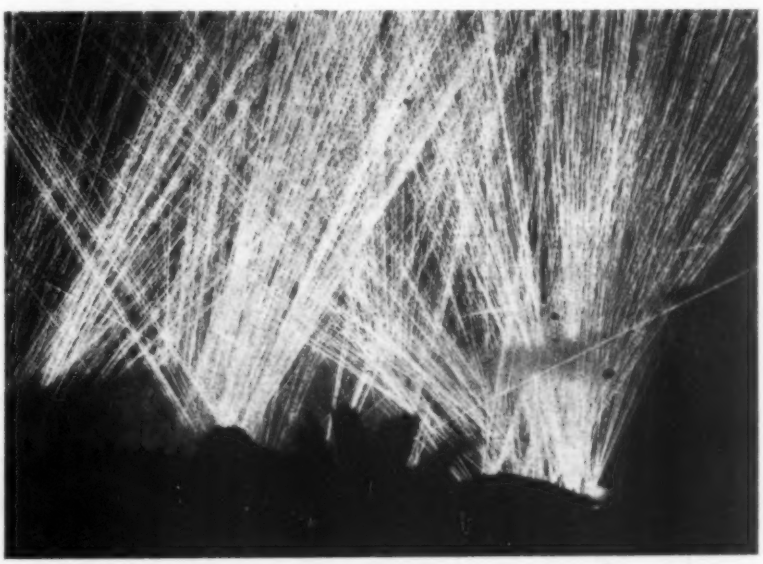
## *Reaction to Bombing in Italy : Closing in Round Rommel : Spezia Raided : Australia's "Bomber Line"*

AN officer of the Fleet Air Arm who has been a prisoner of war in the hands of the Italians since July, 1940, and has recently been exchanged, has said in an interview that he believed the dominant feeling in Italy was a longing that the war should end, regardless of which side won, while the peasants, who are not affected by the R.A.F. raids on industrial cities, are inclined to take the point of view that if these raids bring the end of the war nearer, so much the better ; let the R.A.F. get on with the job and more power to their elbow !

The people of Naples probably concur fairly heartily with the first of these sentiments, but hardly with the second. Their harbour and the country round about have been raided with considerable regularity for some time past, mainly by American bombers from the Middle East, but also from Northern Africa. Since Taranto, Naples has been the main base of the Italian Navy, and is also a base for the supply of war material to Tunisia. In consequence, it is suffering as Portsmouth has suffered. The harbours of Sicily have likewise been hammered.

Whatever may be thought of the inferiority of Italian soldiers to Germans and to British, one must pay tribute to the Italian sailors who take the supply ships across from Italy and Sicily to Africa. They have suffered heavily from Allied aircraft and British submarines, and yet one has heard no rumour of crews refusing to sail.

The Western Desert Air Force has gained a unique reputation in many ways, not least for its extraordinary ability to keep pace with the rapidly moving Eighth Army. None the less, when rushing from Gabes to Sfax and



**ALGERIAN NIGHT :** The criss-cross pattern made by A.A. tracer shells during an enemy raid on Algeria.

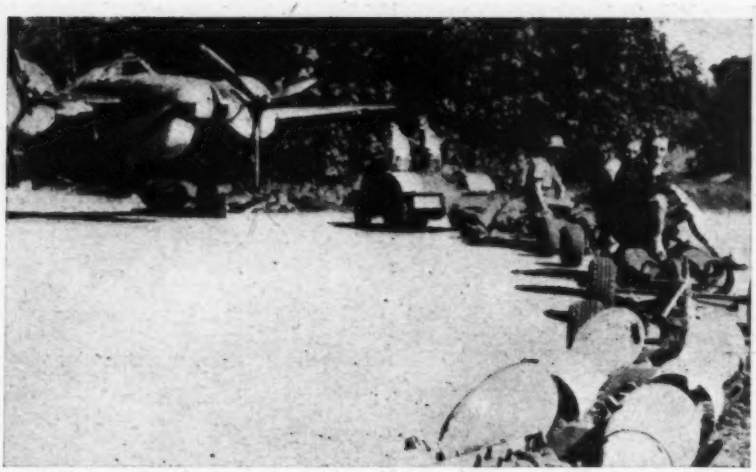
## WAR IN THE AIR

Sousse, Gen. Montgomery's ground troops went at such an amazing pace that for once the fighter squadrons were outrun, and could not keep up. The bombers continued to pound the Axis airfields, and did so much damage that the Allied troops met with little trouble from the air.

As the Axis loses airfields and the Allies occupy them, while the area round Tunis and Bizerta contracts, and especially now that the Western Desert Air Force has joined its numbers and its great experience and skill to the Air Forces previously in North Africa, the blitz on the armies of Arnim and Rommel is bound to increase in intensity. It may well grow into complete air supremacy, and if it reaches that point the task of Gen. Alexander's men will be immensely simplified. Bizerta is a very strongly fortified port, and has large guns facing inland which probably outrange the artillery of the Allies. But that advantage may be nullified if Axis fighters cannot keep Allied heavy bombers at a distance.

The French forces have been bombing in the direction of Enfidaville and it is pleasant to hear of France beginning to play her part in the air once more. In the last war the French air corps was magnificent, and for a considerable time the R.F.C. was mainly kept in the air by French engines. Probably the French in Tunisia are flying American machines.

Another interesting incident has been reported, namely, the shooting down of a Messerschmitt by a British tank. Infantry have sometimes bagged hostile aircraft with rifle fire, but this is believed to have been the first success by a tank.



**BOMBER OF BURMA : A Bristol Bisley at its dispersal point on an Indian airfield. Some of the Bisleys have transparent noses, others have no Perspex. The one in this photograph is a mixture of both.**

As if the blows from the Middle East, from Malta, and from North Africa's Strategic Air Force were not enough to make Italy thoroughly uncomfortable, Bomber Command in Britain joined in with a raid on the naval base at Spezia. At the moment it is probably just as important to strike at the Italian Navy as at the supply route across the Sicilian narrows. Hitherto, Rommel has succeeded in escaping from the clutches of the Eighth Army, and the Allies do not want him to round off his famous retreat (possibly the greatest retreat in all military history) by getting the bulk of his German veterans away across the sea to the mainland of Europe. Some determined action by the Italian fleet, which is still very strong, seems the only thing which could make such an evacuation possible, and so any blow at that fleet is now extremely important. Photographic reconnaissance will doubtless tell in time whether this raid did any major damage.

**TRANSPORT TARGET : Mosquitoes score direct hits on the German railway workshops at Trier. A following Mosquito can be seen just above the bomb bursts. This attack meant 360 miles flying in daylight over enemy-occupied territory, yet none of the Mosquitoes failed to return.**

### "Whispering Death"

THE Royal Australian Air Force has been making good use of its Beaufighters in the Pacific. Operating from Darwin, they have been ranging far and wide, and have been coming in at tree-top level to attack camps, airfields, and troopships. When flying low like that, the sound of their engines is often not heard until the Beaufighters are on to their target, when their heavy armament spreads destruction. The Japanese soldiers are said to have named the Beaufighters "Whispering Death," which suggests that some poetical-minded individuals have been conscripted into the ranks.

None the less, the authorities in Australia are expecting further aggressive moves by the enemy. Gen. MacArthur has made a statement that the Japanese have complete control of the sea lanes in the Western Pacific and of the outer approaches to Australia. The control of those lanes, he said, depended on shore-based air power, and added: "The first line of Australia's defence is our bomber line." He went on to say that Japanese naval forces in great strength were lying within easy striking distance of Australia, but were beyond the range of his bombers. If the Allies were to lose command of the air, a Japanese advance, bringing land troops in ships, would be possible. Mr. Curtin, the Premier, added a warning that the recent reverses which the Japanese have suffered had made no fundamental change in their plans. Nevertheless, the "bomber line" of Aus-

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## WAR IN THE AIR

tralia has proved itself to be a very formidable one, and it is certainly growing stronger as more aircraft are despatched from the factories in Britain and the United States.

### Persistent Japanese

IN the meantime the Japanese have been making efforts to assert themselves in the air. One day last week they sent nearly 100 aircraft in a raid on Port Moresby, which was the strongest raid they had ever attempted on that important Australian port in the south of New Guinea. The result was disastrous to the enemy, for the Australian and American fighters shot down 29 for certain, while the A.A. guns accounted for others. It was reckoned that 37 enemy machines at least were put out of action. A somewhat optimistic report after this action set forth the belief that the enemy's air offensive was blunted and his immediate plans dislocated.

A few days later, however, came a heavy enemy raid on Milne Bay, the scene of a Japanese land defeat some time ago, when an invading force which landed there was wiped out. The Japanese are a persistent nation, and are not easily deterred from a project by heavy loss of life. Loss of material may be more important.

**NOW TURRETED: A Baltimore taking off for a sortie in Tunisia. Note the power-operated twin-gun dorsal turret in place of the old arrangement of pivot-mounted machine guns.**

The improved weather has led to more air activity on the Russian front, and the Red Air Fleet has been able to spare formations of heavy bombers to make several raids on the East Prussian port of Königsberg. Strategic bombing does not seem to hold a high place in Russian military doctrine, and the air fleet is used almost entirely for work with the armies. The Russians are doubtless wise, for their war is almost entirely a land war, and they seem slightly contemptuous of the bombing offensive by the R.A.F. as a means of helping their own efforts. It is, therefore, always interesting when they indulge in a little strategic bombing on their own account.

# New Mediterranean Air Command

## *Three Main Sub-divisions*

THE reorganisation of the Allied Air Forces in the Mediterranean area, outlined by the Prime Minister in his House of Commons speech on February 11th, just after his return from North Africa, has now been completed, and a Mediterranean Air Command established under Air Chief Marshal Sir Arthur Tedder.

There are three sub-divisions of the command—Middle East Command, North-West African Air Forces, and R.A.F., Malta. The A.O.C.-in-C.s of all these smaller commands are directly responsible to Air Chief Marshal Tedder, the Air Commander-in-Chief, who is himself directly responsible to General Eisenhower for all air operations in the North-West African theatre of war. The Deputy Commander-in-Chief of the Allied Air Forces, under Air Chief Marshal Tedder, is Air Vice-Marshal H. E. P. Wigglesworth.

The biggest of the sub-divisions, Middle East Command, is commanded by Air Chief Marshal Sir Sholto Douglas, former Chief of the R.A.F. Fighter Command, with Air Marshal F. J. Linnell as Deputy Commander-in-Chief. It comprises the Air Forces which are disposed in the various countries between the frontiers of India and Tunisia and southwards as far as Madagascar.

The North-West African Air Forces, which include British, American, and French units, are commanded by Major General Carl Spaatz, with Air Vice-Marshal J. M. Robb as his deputy. This command is sub-divided into five subordinate formations, three of which are operational, the remaining two dealing with training and servicing. Throughout this command British and American staffs have been combined and work as a unified organisation. The operational formations comprise the Tactical Air Force, commanded by Air Marshal Sir A. Coningham, with Brigadier General L. S. Chuter as his deputy; the Strategical Air Force, under Major General James Doolittle; and the Coastal Air Force, under Air Vice-Marshal Sir H. P. Lloyd. The Tactical Air Force is divided into three main groups: The Western Desert Air Force, under Air Vice-Marshal H. Broadhurst, operating in support of the Eighth Army; the 12th United States Air Support Command, under Brigadier General P. L. Williams; and another force commanded by Air Commodore K. B. B. Cross, in support of the First Army in Northern Tunisia.

The principal duties of the Tactical Air Force are defined as supporting the armies operating in Tunisia. Its aircraft consist of fighters, fighter-bombers, light bombers, and observation aircraft. The Strategical Air Force is composed of United States heavy and medium bomber units and R.A.F. medium bomber units. Its duties comprise long-range attacks on enemy bases in Tunisia, Sicily, Sardinia and Southern Italy, as well as attacks on enemy communications and shipping. The Coastal Air Force embodies R.A.F. and United States general reconnaissance wings and fighter squadrons, and its functions are to defend our bases, ports and supply centres, as well as to attack enemy shipping and carry out anti-submarine patrols and reconnaissance.

### The Functions of Malta

The R.A.F., Malta, which previously formed part of the Middle East Command, now comes directly under the Mediterranean Air Command. It is commanded by Air Vice-Marshal Sir Keith Park. This force has fighters for day and night defence of the island, bombers and torpedo-bombers to strike north against Sicily and Italy and west against targets in Tunisia and the Italian islands of Pantelleria and Lampedusa, as well as for offensive operations against enemy convoys, and for convoy escort, anti-submarine and general reconnaissance patrols.

# HERE AND THERE

### Shannon Airport Manager

IT has been announced in Dublin that Colonel Patrick Maher, former Director of Artillery in the Eire Army, has retired from the Army. He has been appointed manager of the Shannon Airport, Foynes, Co. Limerick.

### Aircraft Production in Canada

CANADA'S aircraft output has shown a remarkable increase. Some figures recently announced disclose the fact that 400 aircraft a month are now produced, whereas the output for the 12 months before the war was only 40 machines.

### Australian Personnel in R.A.F.

MR. A. S. DRAKEFORD, Australian Air Minister, has announced that Australians serving in the R.A.F. are to be grouped into complete air crews and squadrons, subject to operational exigencies.

This grouping will also enable Australian officers to attain higher commands than has been possible with Australians dispersed among the R.A.F.

### Berets for R.A.F. Regiment

BERETS which are to be worn by the R.A.F. Regiment will in all probability be in Air Force blue, although the exact shade has not yet been decided. The manufacture of these berets has not yet begun on a large scale, so replacement of the field service cap will be very gradual.

The R.A.F. Regiment is following the general Service trend towards berets in preference to the field service cap.

Sir Archibald Sinclair has said that the possibility of the R.A.F. generally changing over to berets is under consideration, but a decision may not be reached for some time.

### Swell Job!

AIR VICE-MARSHAL SIR ARTHUR CONINGHAM has sent the following message of congratulation to the Commander of the U.S. Army Air Force day bombers in Tunisia:

"Let me congratulate you and your squadrons on the courageous, persistent and successful way in which you attacked La Fauconnerie. The combined air and army operations which led to the break through at Gabès was materially assisted by your action. The air officer commanding, Desert Air Force, who was with me to-day, confirmed the attacks, and reported that upwards of twenty-five destroyed aircraft were left by the enemy. Well done; we all send you our thanks."

### Air Letter Service Extended

THE 6d. air letter service has now been extended to H.M. Forces (and to men of merchant ships calling at the ports) in South Africa, Northern Rhodesia, Southern Rhodesia, Nyasaland, Mauritius, Seychelles, China, North America, South America, Australia and New Zealand, and to all other countries to which there is an ordinary air mail service.

Air letters will normally be conveyed all the way by air to bases in Africa and to other countries served by all-air routes. Where air services are not available all the way (for example, to Australia and New Zealand) they will be used to the maximum extent.

**"COME UP AND SEE ME SOMETIME." Demonstrating how a man might be picked up or landed in enemy territory by a Sikorsky helicopter.**

### And Do It Now!

THE setting up of a Commonwealth Airboard to represent the British Commonwealth of Nations, and comprising men from the Dominions with experience of civil flying, was suggested during last week's debate in the Commons by Mr. Granville, who said they should meet in an aircraft, and not in any circumstances in a Government Department!

### New U.S. Carriers

AT Washington recently Col. Knox, Secretary of the Navy, stated that the United States now has dozens of new auxiliary aircraft carriers in action.

The new ships are enabling American air power to spread out over all the vital supply lines of the United Nations, and scores more of them are being built.

### Civil Aviation in Western Scotland

FURTHER developments in the post-war planning of civil aviation in the West of Scotland is revealed by the motion of Glasgow Chamber of Commerce to appoint a committee under Sir A. Steven Bilsland, Bt., M.C., D.L., to investigate the future of air transport.

The Junior Chamber of Commerce has been invited to appoint two representatives to the committee, which has the power to add to its number.

### Extended Airline Facilities

AER LINGUS TTA (Irish Air Lines) announces that negotiations have now been satisfactorily concluded with West Coast Air Services, Ltd., of Great Britain, and the British railway companies, whereby it will be possible to extend the following facilities to passengers travelling between Ireland and Great Britain.

Combined Air-Rail bookings may now be effected, and a further facility includes the interchangeability of air and rail and/or steamer tickets. Arrangements have also been completed for the acceptance of railway bulk travel vouchers, for travel via the existing air services operating between the two countries.

### A Chance in the A.T.A.?

MEN not eligible as pilots in the R.A.F. or Fleet Air Arm have often written to *Flight* asking if there was any way of learning to fly at the present time.

The answer has always been that, if a person has had previous flying experience, A.T.A. may take him or her for training as a ferry pilot, but that otherwise there was no hope.

That answer, however, may not be true for all time. The number of those with pre-war flying experience who have hitherto been available for the A.T.A. must be strictly limited, and, if that is so, what is to happen when that source begins to fail and A.T.A. has to look farther afield? It is not unreasonable to suppose that when that time comes men with no flying experience will be needed to be trained *ab initio*.

It would obviously be the older men who would be affected, since those below 31 are, if fit, eligible to fly in the R.A.F. But those above that age may well find themselves presented with the chance for which they have waited so long.

We would, therefore, suggest that any enthusiasts who are prepared to take a chance might well send in their names to the A.T.A., so that when the time that we envisage does actually arrive they will at least be the first on the list.

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### Hurricane IID Tank-Busters

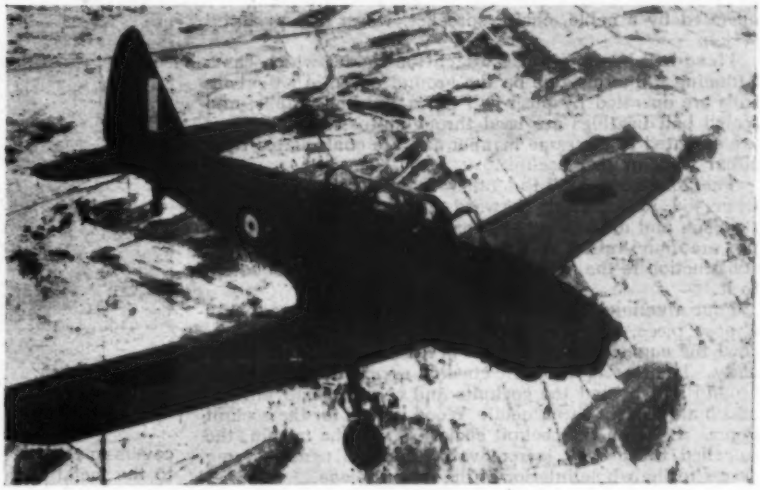
TOO late for this issue official photographs were released this week of the R.A.F. Tank-Buster Hurricane IID. Fitted with heavy-calibre guns designed primarily for attacking armoured vehicles, Hurricane IID carries two 40-millimetre guns, one being fitted in each wing. They are capable of automatic or single-shot fire. This new weapon has been designed specially for aircraft use and weighs only 320 lb. The Hurricane IID is used for attack on tanks, armoured fighting vehicles and transport in the Middle East and N. Africa. The aircraft are known as tank-busters, but the squadrons using them prefer the term "tin-openers." Illustrations will appear in the next issue of *Flight*.

# A New Empire Elementary Trainer

## *Construction : Equipment : Engine : Flying Characteristics*

AS fast as they become available, new Cornell elementary trainers are passing into service in the Empire Schools spread across Canada. The Cornell is a low-wing, tandem monoplane very similar to and developed from the American Fairchild primary trainer. It is now being built under licence in Canada.

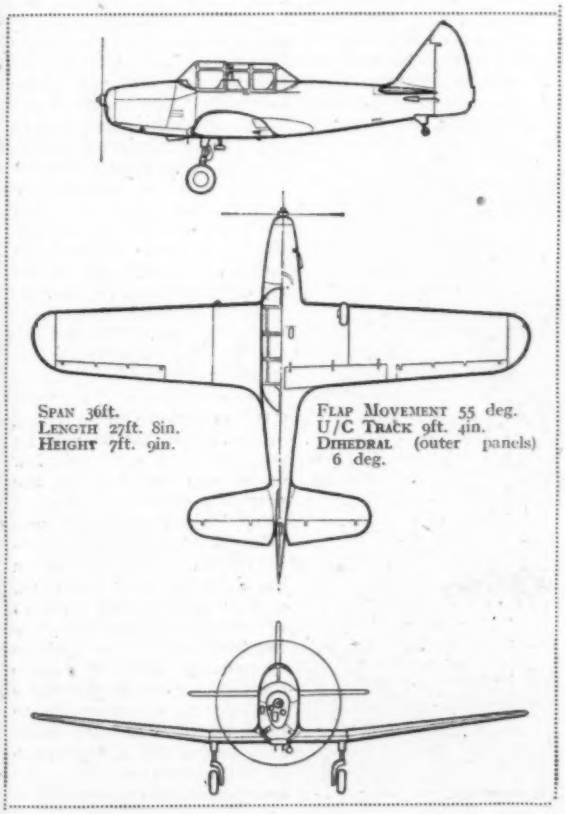
For some time the Fairchild has been flown as a trainer in the United States and by the Norwegian Air Force in Canada, so it is by no means untried for the job which it is to do in the slightly modified form — The Cornell.



A Fairchild Cornell of one of the E.F.T.Ss in Canada, flying over snow-covered fields.

### Construction

To give an impression of the size and layout it might be described as a compromise between Magister and Gull. The cantilever wings and the tail plane and fin are of wood construction with plywood covering, while the fuselage has welded tubular framework, part fabric and part metal covered. Flaps and widely spaced fixed landing wheels are fitted, and the cockpit enclosure is roomy and sturdy. Surface finish is notably good.




Dealing with the construction in more detail, the wings are of the conventional two-spar layout, built-up box spars being used. The outer sections are fully cantilever and taper at both leading and trailing edges. Also of wood and ply construction, the centre section is bolted up to and passes through the fuselage.

The wing ribs are in three separate sections, nose, inter-spar and trailing edge. Tubular steel compression struts are used between centre-section spars and at the roots of the outer wing sections. Petrol tanks are strapped into the centre section, one each side of the fuselage.

Light alloy framework with ply covering comprises the ailerons, and each has a small metal trimming tab adjustable on the ground. These differ from the flaps, which are of all-metal construction. Aileron and flap fittings are made up from alloy sheet.

### Tail Control Surfaces

Both tail plane and tail fin are similar in construction to the main planes, but elevators and rudder are fabric covered and have light alloy frames and leading and trailing edges. The construction of both elevators and rudder centres around their steel torque tubes. In the case of the separate elevators, the two torque tubes are bolted together at the centre line with the aid of plates and the operating arm from the control column is attached at this point between hinges. In all, six hinge points attach the

**Fairchild Performance (Makers' Figures)**

Maximum speed 131 m.p.h. at 2,450 r.p.m. at sea level.
Normal cruising 105 m.p.h. at 2,050 r.p.m. at sea level.
Stalling speed 55 m.p.h.
Range with 45 gal. at 105 m.p.h. 455 miles.
Loaded weight 2,400 lb.
Service ceiling 15,000ft.
Take-off to 50ft. with no wind at sea level 950ft.
Landing run with no wind at sea level 875ft.
Best rate of climb (loaded) 920 ft./min.
Fuel capacity 45 gal. Oil capacity 4.1 gal.

**Ranger L-440-1 Engine**

Six cylinders, air cooled, inverted.
Rated at 175 b.h.p. at 2,450 r.p.m. at sea level.
Compression ratio 6:1.
Bore and stroke 4½ by 5½in.
Length 53in. Width 20½in.
Height 31⅞in. Weight 365 lb.

# A NEW EMPIRE ELEMENTARY TRAINER

elevators, and each elevator has a separate trimming tab operated by a cable, chain, sprocket, worm and push-rod system.

Three ball bearing hinges attach the rudder which has a trimming tab adjustable on the ground only. All the controls are operated by push-pull tubes and bell cranks, and sealed ball bearings are used throughout. The split flaps are operated in the same manner and are controllable from either front or rear cockpit.

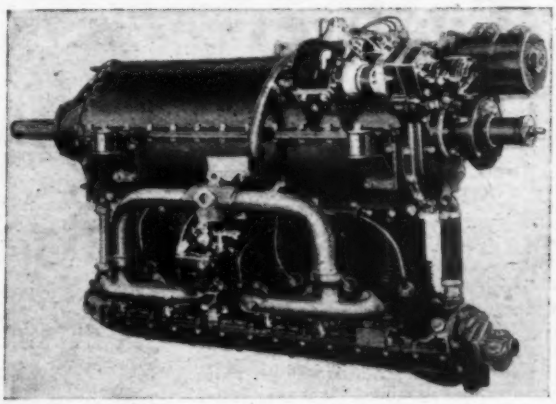
The longerons and the other main fuselage members from the rear cockpit forward are square tubes. The stringers and all bracing members to the rear of the cockpits are round tubes. A separate engine mounting of similar construction to the forward portion of the fuselage is bolted to it.

Four aluminium panels attached by Dzus fasteners, and a nose piece, all supported on steel tubular framework, cowl the engine, which is both accessible and clean externally. The fuselage is fabric covered except for the decking around and behind the cockpits and certain small fairings which are of light sheet metal. Wood is used for the cockpit floors. Between the cockpit enclosure and the tail fin, the so-called turtle deck is removable in large panels giving access to the whole interior of the rear fuselage.

## Undercarriage

The undercarriage consists of separate port and starboard cantilever units comprising cast magnesium alloy housings and attachment fittings bolted to the front main spars and welded half forks and cylinders of heat-treated chrome-molybdenum steel. Oleo legs of the normal spring and oil type are used, but the design eliminates packings and glands and provides for landing loads to be taken by the oil without rebound and taxiing by the spring. A nutcracker-type torque knee connects the cast housing to the cylinder assembly. Tyres, size 6.50 × 10in., and hydraulic brakes are fitted.

A steerable tail wheel is utilised, the operating arm being spring-loaded and attached to the rudder control rod. As is now the usual custom, the tail wheel can be caused to become disconnected and free to castor if the pilot wishes to turn sharply or pivot about one wheel. A leather boot covers in the tail wheel assembly from just above the fork to the metal fairing on the fuselage.



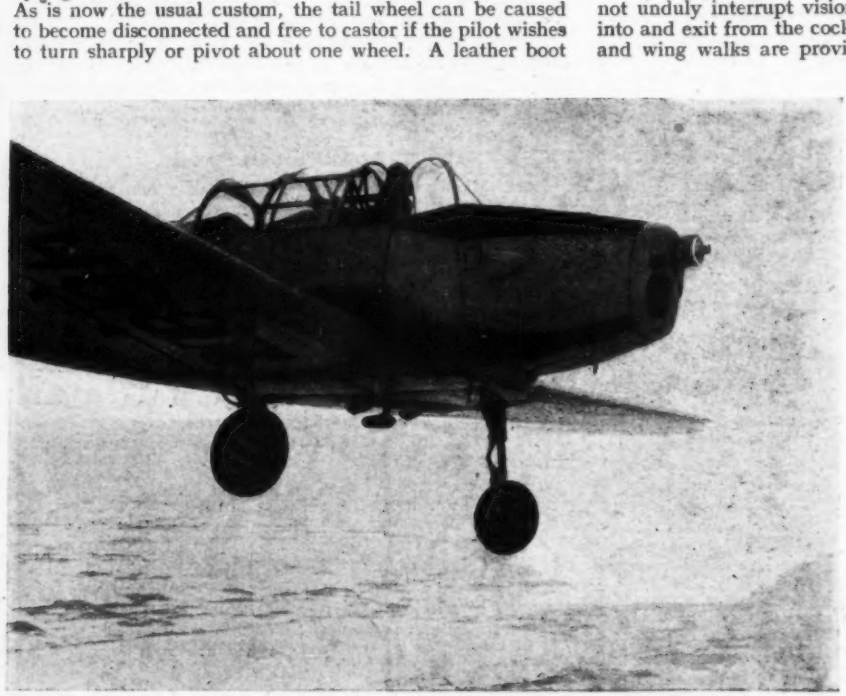
The 175 h.p. six-cylinder air-cooled Ranger engine.

## Cockpit Layout and Equipment

From the instructor's point of view, the Cornell has many good features and few weak ones. With regard to equipment and layout of the cockpit it is undoubtedly among the best elementary trainers produced so far, and the impression gained is that, exceptionally, the designers have consulted the man who best knows the requirements and who will have to use the aircraft—the instructor. For example, characteristics of the Cornell include:

Cockpits sufficiently roomy with good visibility from both of them. Cockpit enclosure with its fixed centre portion and sliding front and rear covers well designed and sturdy, a centrally placed crash pylon which looks strong enough to give proper protection in a somersault but does not unduly interrupt vision from the rear cockpit. Entry into and exit from the cockpits is quite easily accomplished and wing walks are provided on each side. Seat height and rudder reach are adjustable in flight, and a harness release catch is provided to permit freer movement after the straps have been done up. Formerly these refinements had been restricted in the main to Service type aircraft.

Controls work easily and smoothly and, with the exception of the flap lever, are within comfortable reach for all manœuvres. The flap-operating lever can be locked in the down, midway or up position, and is situated low down and forward on the port side of the cockpits. A normal sized pilot has considerable difficulty in reaching and releasing the lever on the floor to lower the flaps, also in locking the lever in the down position after raising the flaps. It is most inconvenient and at times dangerous to lower the pilot's seat during an approach to land, so it has become necessary to develop a flap-lowering technique employing the heel and hand together. This



In this flying close-up the good view from both cockpits is apparent.

is obviously not very satisfactory.

The brake pedals attached to the rudder pedals are easy to operate and the brakes themselves are smooth and effective. A parking brake lever is fitted on the starboard side. The rudder is operated by separate pedals moving fore and aft rather than the less comfortable centrally pivoted rudder bar.

Many elementary trainers have in the past been produced with particularly poor Heath Robinson-like elevator trimming devices. The Cornell, however, has a good and effective trimmer, the only slightly weak point of which is the position indicator. A very small opening in the casing around the sprocket makes visible red or black numbers depending upon the position fore or aft of the neutral position marked O. These small "messily" painted figures are rather hard to distinguish and therefore difficult to point out and explain to an elementary pupil. It is admitted that this is a fairly unimportant point on the type, but correct trimming and use of trim is an important item in a pupil's training from the earliest stages.

The Cornell in the air seen from another aircraft in formation. It cruises at about 95 m.p.h.

Front and rear cockpits are similarly equipped and the aircraft can be flown solo from either one. A sensitive altimeter, vertical speed indicator and primary blind flying instruments are fitted, and provision is made for Sperry's.

Comfort, the value of which cannot be overestimated, must be judged high on the Cornell. Already room, visibility, adjustable seat and rudders have been appraised; in addition, the blind-flying hood is effective and can be raised and lowered quite easily. The enclosure can be opened and closed without difficulty. The fuel gauges on top of each tank can be read without any trouble by looking over the side of the cockpit. A four position fuel tap is fitted on which both lower segments are "off." There is no reserve position and no provision is made for a reserve supply of fuel.

### Cockpit Heater

One poor characteristic can sometimes go a long way towards offsetting a number of good points making for comfort. The Cornell has one which is common to many trainers, namely, the cockpit heater. It seems almost inevitable that the temperatures experienced during a Canadian winter shall be underestimated. For thirty minutes or an hour if outside temperatures are not unusually low, the Cornell is not uncomfortably cold when full flying kit is worn. Instructors, however, must often fly two and three hours at a stretch and five or six hours in a day. For this the heater is not really adequate if the temperature is below zero, and, what is more, it seems in many cases to produce fumes which though not dangerous are definitely unpleasant and bring on early symptoms of sore throat and fatigue.

Intercommunication is by a simple speaking tube system and due to the comparatively quiet cockpits instructors will find that hearing is well above the average on the Cornell. This, of course, presupposes that the tubes are well installed and undamaged on the particular aircraft.

The remaining equipment not so far mentioned specifically includes a rear-view mirror, a map holder, baggage space, and one small hand-operated fire extinguisher mounted on the back of the engine bulkhead and accessible from the front cockpit or through a small door from outside. Provision is made for night flying and a wind-driven generator is located centrally beneath the centre section.

### The Power Unit

The engine is a six-cylinder, air-cooled Ranger, neatly cowled and driving a fixed-pitch wooden airscrew. It is said that the airscrew fitted does not suit the Ranger engine as well as did the McCauley ground-adjustable, metal type fitted to the original Fairchild. This is given as one reason for the difference in performance between the two types. Certainly the Cornell has a rather reduced performance as compared with makers' figures for the Fairchild.

This mark of Ranger engine, the L-440-1, is rated at 175 b.h.p. at sea level. Other engine data are listed on page 413, with some aircraft dimensions and performance figures. Characteristics of the engine include its neat underhead camshaft, which, by eliminating push-rods and casings, makes for a clean-looking exterior. The camshaft is driven through a vertical drive at the front of the engine.

Starting is by hand through reduction gearing, a priming pump being located beside the socket for the crank on the rear port side of the engine. The pilot keeps up fuel pressure with the wobble pump and starts up on port ignition system.

### Flying Characteristics

Although its performance is quite commonplace, the Cornell flies easily and pleasantly. The take-off is fair and the climb quite good, and both climbing and gliding are taught at 80 m.p.h. Normal cruising speed is 90-100 m.p.h. and top speed 110-115 m.p.h. The stall occurs gently and is usually accompanied by the dropping of one wing, as often as not the right wing. The stalling speed of about 58 m.p.h. is on the high side for the type and there is little alteration of stalling speed with flaps lowered in that their primary effect is as an air brake to increase the gliding angle. With flaps up, the Cornell can be sideslipped rather unsatisfactorily, but with a small increase in rate of descent. With the flaps down, sideslipping is ineffective and is not easy to prolong with speed under control. In an emergency, height can be lost quickly on a slipping turn.

Weathercock stability is good, and under cruising conditions accurate turns can be made with feet off the rudder pedals.

Spinning is normal and recovery rapid. In this as in some other features the Cornell resembles the Harvard II, and it is therefore a splendid elementary type for pre-Harvard instruction. To quote a particular instance, on taking correct action for recovery from a spin, the Cornell may momentarily tighten and speed up in the spin, as does

## A NEW EMPIRE ELEMENTARY TRAINER

the Harvard. An instructor recognises this as the first sign of recovery on either type, but there must have been many anxious moments among pupils who had not understood this peculiarity.

Landing presents no difficulties and is reminiscent of the Magister in view of the "flat" attitude and comparatively small backward movement of the stick required to touch down on three points.

Aerobatics are not very easy, which in some ways is good on a trainer, providing it has no vicious habits in unusual positions. At the recommended speeds for rolls (120 m.p.h.) and half-rolls off the top (160 m.p.h.) it is difficult not to "run out" of control just before completion of the manœuvre. This applies particularly to the rudder for maintaining direction and preventing skid at the completion of any roll. A quite satisfactory R.C.A.F. type roll can be made, and this is the type usually taught. This is, in fact, almost a barrel roll, starting with the nose high and keeping the engine running during the whole roll.

During the maximum-rate climb and, to a lesser extent, on the glide, a fair amount of rudder is required to counteract torque, or the lack of it, but under all conditions of level flight the aircraft maintains a good steady course with wings level and feet off.

The Ranger engine is smooth and readily responds to the throttle at all engine speeds. It would not, however, pull a pilot out of a tight corner like the Gipsy Major in a Tiger Moth. This is not, of course, a reflection on the engine, but is a matter of aircraft type. It is worth remembering, however, during, say, instruction in precautionary landings, or following a bad landing, particularly if the instructor has been used to flying the Tiger Moth.

Restrictions are few, the Cornell being fully aerobatic except for outside loops, bunts and the like. The maximum speed permitted has recently been reduced in the Service to 185 m.p.h., although it originally stood at 220 m.p.h., with 90 m.p.h. the maximum for flick rolls. It is understood that this reduction in limiting speed is due rather to airscrew limitations than to any doubts as to structural strength of the aircraft.

# "Air Force"

## *A B-17 Film Saga Produced With U.S.A.A.F. Co-operation*

DESCRIBED as the first picture produced with official sanction to portray the activities of the U.S. Army Air Force, the Warner Bros. production "Air Force" certainly lacks nothing in excitement and vigorous action. It is said that when General H. H. Arnold offered the U.S. Government's co-operation he insisted on "complete authenticity" and said to producer Hal B. Wallis and director Howard Hawks, "Tell how the Japs laced hell out of us at first. Then tell how we struck back. Tell the whole story with its bitterness and sadness and heroism."

It has not been placed on record, so far as we know, whether General Arnold has expressed his satisfaction with the result, but all the ingredients he specified have been worked into the story in varying degrees. For apart from the very neatly introduced glimpses of the lighter side of life in the U.S. Army Air Force, the greater part of the film stresses the now historic initial successes of the Japs in their attacks on Pearl Harbour, Wake Island and the Philippines, and it is only towards the end that one sees, in a reconstructed version of the Battle of the Coral Sea, the American flyers "lacing hell" out of the Japs for a change. The story ends with a scene in an operations room in which Fortress crews are being briefed for a raid on Tokio, with its implication that America has finished "taking it" and is now about to "dish it out" in real earnest.

And here, it must be said, the producers have dispensed with historical accuracy and, perhaps, substituted a glimpse into the future, for that operations room was in Australia, where the gallant heroine of the story, a B-17 by the name of *Mary Ann*, together with the survivors of her original crew, finished a 7,000-mile adventure which began as a training flight, on December 6th, 1941, from the Golden Gate to Honolulu.

The story, based on actuality, is briefly this. The *Mary Ann*, captained by John Ridgley, and with Harry Carey as the veteran sergeant of the aircrew, sets out with eight other Fortress I's on a training flight from San Francisco to Honolulu. Nearing the island the wireless operator reports that the radio at Hickham Field (Pearl Harbour) has gone off the air. Over the R/T they are puzzled to hear excited Jap voices, then Hickham Field comes in just long enough to tell them they are being attacked by enemy aircraft and that the squadron (which is carrying no ammunition) must disperse and use emergency airfields.

What happens to the rest is not very clear, but the *Mary Ann*, after an emergency landing at Maui, has to take off again in a hurry to escape an ambush, and lands at Hickham Field among the bomb craters just after the raiding Japs have left. But they are not allowed to stay there and, hurriedly refuelling, take-off again for Wake Island, only to find this also has been raided and that they must push on at once to Manila where bombers are needed against the steadily advancing enemy.

Now the real excitement begins, for the *Mary Ann*, bombed-up and armed, after narrowly escaping destruction on the ground, takes part in a terrific air-sea battle and is finally put down in the surf of an Australian beach riddled with bullets and *flak* and with two of her four engines out of action.

But before this final landing, there have been running fights with Jap "Zeros," many of which are seen to break up in mid-air under the fire of the *Mary Ann's* 0.5in. machine guns, frantic repairs on the ground with the Marines holding back the advancing Japs till the last possible second, and the smashing up of a Jap invasion fleet by B-17's and Dauntless dive-bombers.

These sea shots are about the most amazingly realistic pictures of wholesale destruction we have ever seen on the screen, and the fact that some of the explosions dithered the camera indicates that they were not mere "stagey" puffs of black smoke. Indeed, it seems impossible to have obtained many of these scenes without personal injury or even fatalities, and it may well be that parts of official films of the real thing have been used in their making. At all events, nobody can say he has not got his money's worth; General Arnold's plea for "authenticity" would appear to have been enthusiastically heeded.

Nevertheless, the film is not all blood and tears, for there is a well-balanced leavening of humour inseparable from life in any Service, even at its grimmest, and about the only moment of obvious artificiality was when a Japanese flag was shown slowly sinking into the waves during the sea battle—though even this had its symbolic value as marking the turning point in the fortunes of war. The film runs for approximately two hours.

# Licensed Aircraft Engineer

## *Revised Procedure for Examinations: Higher Standard of Engineering Knowledge from the Specific to the General*

GOODNESS only knows what persuaded the Air Ministry to give to the man who ensures the fitness for flight of an aircraft the title "Ground Engineer." The term conjures up visions of a man grovelling about in the mud digging ditches and cleaning-out drains. The uneuphonious name was accepted and passed into common usage. What injustice was done thereby to a fine body of men would be difficult to assess. Upon their skill and integrity depended the safety of many lives in civil aircraft.

Notwithstanding the unattractive-sounding title, it is evident from the number of enquiries which *Flight* has been receiving in recent months that large numbers of men in the Services hope that civil aviation will provide employment for them after the war. Unfortunately there appears to be a general impression that the wartime experience of these men will be a good stepping stone towards becoming "Ground Engineers." They appear to be under the impression that civil licences are much easier to obtain than in fact they are.

Knowing from personal experience how great is the interest in this subject just now, we welcome heartily the appearance of a little booklet, published by the Air Registration Board, entitled "The Duties of a Licensed Aircraft Engineer." And we are sincerely pleased to see that the Air Registration Board has steered clear of the ugly title "Ground Engineer." The new expression "Licensed Aircraft Engineer" is, as yet, quite unofficial, but it deserves to be adopted by the authorities.

The booklet reveals a change in the procedure for examinations for licences. In the past, the candidate was examined orally by at least two fully qualified examiners, who might spend an hour or more in an examination which would result in nothing more important than the granting of a simple licence in categories A or C. This method was much too cumbersome and expensive for dealing with any but small numbers of applicants, and in view of the increasing number of applications it was obviously good sense to place the examination on a basis which, while giving proof of a man's ability, would enable larger numbers to be dealt with at a time.

### Modern Standards

Furthermore, the growing complexity of modern aircraft obviously required that the standard of general knowledge which the men who were licensed to testify them should have must be higher than it has been in the past. One may assume that, at the same time, the Air Registration Board did not wish to raise the standard to such an extent that it would exclude the man who was employed by a small operator to sign-out small and simple aircraft. A compromise, and one which appears reasonable, has been struck by dividing each category into "Restricted" and "Unrestricted" classes.

"Restricted" licences are defined by means of lists of comparatively simple aircraft and engines. Provisional lists are printed on sheets inserted in the handbook. Further lists may be issued from time to time in "Notices to Aircraft Owners and Ground Engineers."

In the case of all licences emphasis has now been removed from the particular detailed knowledge of a specific aircraft type to a more general and higher standard of engineering knowledge. This should ensure that, although the man may never have met the particular problem with which he has to deal, yet from his general knowledge and wider experience he should be able to exercise sound judgment.

The man who requires an "A" licence may obtain it in a "Restricted" category. This will enable him, for instance, to act as engineer of a flying club. If he needs his licence on larger aircraft he may obtain an "Unrestricted" licence if his experience warrants it. This may be applicable to any type of aircraft, irrespective of size, but may confine the holder to either landplanes or marine aircraft, or to either air-cooled or liquid-cooled engines.

### Category Limitations

In category "B" (that is dealing with the construction and repair of airframes) similar restrictions may be imposed, but in practice the division will not be so marked on account of the fact that the knowledge of materials, inspection during construction, etc., are requirements common to both large and small aircraft. There will, however, be a considerable difference in the *standard* of knowledge required, as it is intended that the holder of a "B" licence for all aircraft should be a fairly good technical man, quite apart from his particular knowledge of the construction of one type.

Similar considerations apply to category "D" (engines).

The operating licences "A" and "C" are essentially in a lower technical category than the constructional licences "B" and "D." The nature of the latter is by way of being a technical qualification in addition to being a legal requirement.

For the benefit of those who have no knowledge of present "Ground Engineers' Licences" it may be explained that category "A" covers fitness for flight of airframes, and certain minor repairs, modifications and replacements. "C" covers the same for engines. "B" and "D" cover certification of airframes and engines respectively after overhaul, and after major repairs or modifications.

Engineers licensed in these four categories are expected to have a general knowledge of all instruments and equipment. This is sufficient to enable them to exercise their certifying powers in respect of the whole assembly, but the complexity of equipment has made it necessary to create a specialist class of licence to cover overhaul and repair of specific items. This enables the engineer in the four categories to obtain a supporting certificate from a specially qualified source before he signs his own clearance. To this specialist category the general description of "X" is applied.

An engineer licensed in category "A" may not sign the Daily Flight Certificate for an aircraft which carries, for example, a compass unless he has previous evidence of the certification of the adjustment of the compass by a holder of an "X" licence. An "X" licence may be held by a genuine specialist with a single endorsement, but there is, of course, nothing to prevent a man holding a whole collection of such endorsements. Conversely, an holder of a licence in the four categories mentioned above may, of course, possess an "X" licence if he has qualified for it.

The new booklet, which is sold at the very modest price of 1s., deals with the duties of a Licensed Aircraft Engineer, and it gives particulars of the examinations for the issue of licences. Thus it will help the prospective engineer by explaining the knowledge needed and the procedure to be followed.

It is very difficult for the operating engineer to find out precisely what his duties are in any particular instance because they are so well buried in a mass of Statutory Rules and Orders, Air Navigation Directions and Regulations, Notices to Aircraft Owners and Ground Engineers, and Airworthiness Handbook A.P. 1208. The new booklet will therefore also serve the purpose of informing the holder of a licence whether his knowledge is as good or as up to date as it should be.

Copies of the handbook may be obtained from the offices of the Air Registration Board, 103, the Promenade, Cheltenham, Glos, by personal application or by letter; or they may be obtained through booksellers.

# Behind the Lines

## *Service and Industrial News from the Inside of Axis and Enemy-occupied Countries*

### New Outfit

NEUTRAL sources report that a new type of warm clothing has been perfected by the *Luftwaffe*. Based on their experience in Norway, the new airman's outfit resembles the clothing worn by the Laps and weighs about 8 lb. As compared with the standard clothing hitherto used, which weighs 55 lb. and is electrically heated, the new clothing is said to introduce considerable economy in material and production time.

### Italian Expenditure

THE Budget estimates for the financial year ending June 13th, 1944, have been approved by the Italian Cabinet Council. The estimates provide for an ordinary appropriation of 4,340,176,000 lire, or slightly more than the corresponding figures in the current financial year. It should be understood that this amount does not include expenditure caused by the war, which is covered by special, currently made allocations.

In addition, the official Italian Gazetteer, the *Gazzetta Ufficiale*, of December 24th, 1942, published a decree authorising the Air Ministry to make financial commitments for the purposes of war up to 3,000,000,000 lire in excess of the amount provided for by the ordinary votes.

### Continental Air

A REPORT in the German Press announces the formation of a new Italian transport company, the *Societa Trasporti Adriatici-Balcani*. The object of the company is to operate passenger and goods services from the Adriatic coast of Italy to South-Eastern Europe. For this purpose the company, which has an initial capital of 5,000,000 lire, is to be granted a Government concession.

The Zürich-Stuttgart-Berlin air service operated by Swissair has been curtailed until further notice. Services on the Stuttgart-Berlin sector have been suspended, while the Zürich-Stuttgart service continues to operate and links up with the services to Portugal and Spain.

### Report from France

AS previously reported, the entire aircraft industry in Southern France was ordered to close down shortly after the German occupation of the "Unoccupied Zone." Together with the disbanding of the Vichy Air Force, orders placed with the industry by the Vichy Government were suspended and development orders stopped.

While it is known that certain sections of the industry worked for German orders, it can be assumed that the Germans will now regiment the aircraft works in the previously unoccupied part for their war effort. In this connection some details of the current state of production may be of interest.

With regard to the three giant flying boats, the 43-ton Potez SCAN 161, the S.E.200 and the Latécoère 631, described in *Flight* of August 13th, 1942, it is known that for security reasons they are to be transferred from Marseilles to a new base at Amphion, near the bathing resort of Evian, on the French side of the Geneva Lake, where workshops for overhauls and maintenance are to be established

At the development centre at Cannes (formerly the S.N.C.A. du Sud-Est) the designs of a mid-wing bomber "1030," powered with two Hispano-Suiza 12Z engines, driving two coaxial contra-rotating airscrews, were on the production agenda.

From the marine air base at Antibes, near Cannes, a prototype of a twin-engined seaplane, the N.C.420, has been reported. No details of the aircraft are available, but it seems to be based on pre-war designs and intended for training and coast patrol duties.

The Chausson works of Asnieres, Seine, manufacturers of aircraft engines and automobile parts, which are reported to be co-operating with Henschel, have erected a plant for the production of aircraft parts near Marseilles. This company is reported to have participated in the development of a tailless four-seater touring aircraft of extremely simplified and robust design.

Finally, there is another effort to be recorded—the Breguet 500 twin-engined transport aircraft, two prototypes of which are awaiting the installation of engines at the Toulouse works of the *Ateliers d'Aviation Louis Breguet*.

The Breguet 500 is an all-metal mid-wing monoplane with slender trapezoidal wings fitted with Breguet-patented two-section landing flaps, a twin rudder and an undercarriage retracting into the engine nacelles. Powered with two Gnome-Rhone 14R engines, each of 1,600 h.p. for take-off, the aircraft has an empty weight of 15,870 lb., a useful load of 13,890 lb., and a range of 1,240 miles at 250 m.p.h. cruising speed. Wing loading is 41.4 lb./sq. ft.

**Parachute supply containers, called by the Germans "supply bombs," for isolated units. (Left) A "bomb" being loaded with vitaminised chocolate and dried bread. (Right) Slung underneath the wings of an aircraft. The containers, which are over 7ft. long, can be dropped from a height of not less than 800ft.**

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# Aircraft Types and h

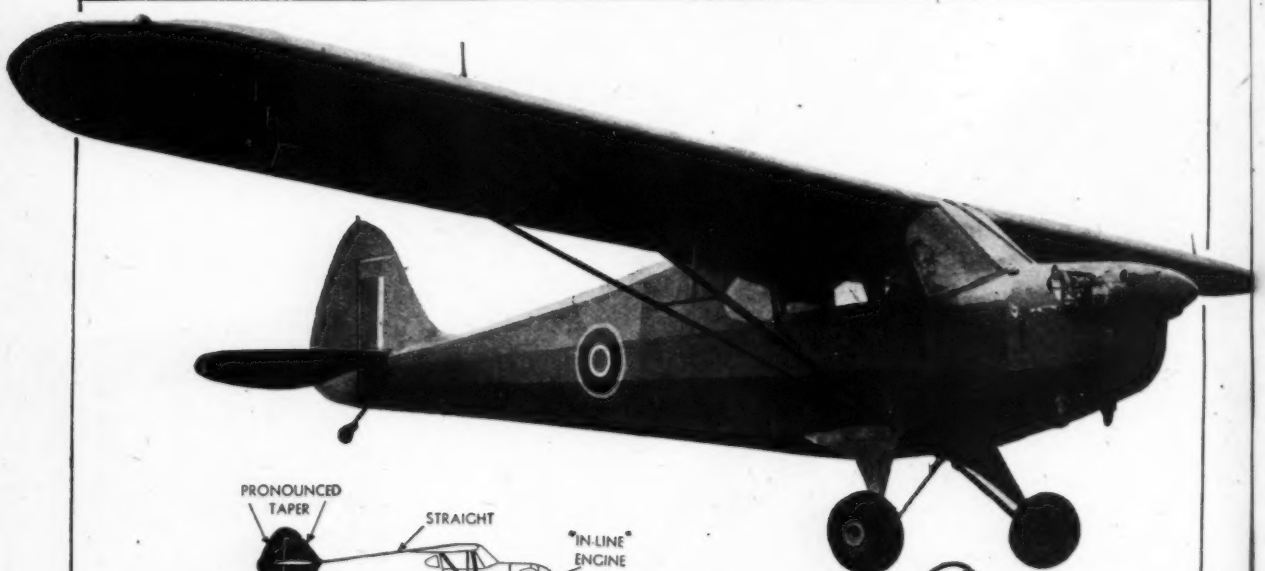
## TAYLORCRAFT AUSTER (L-57)

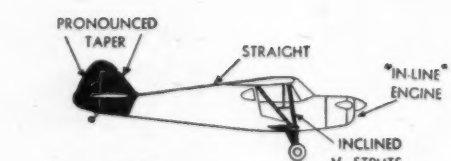
ONE of several light types of high-wing aircraft which in peacetime were prime favourites with flying clubs and private owners, the Taylorcraft is no less a valuable addition to the ranks of military machines on that account. Many thousands of the type, nicknamed Grasshoppers by the Americans with their characteristic flair for the choice of an apt word, are being used in the Civilian Pilot Training programme and by the U.S. Army Air Force for liaison work with the ground forces and as aerial staff cars.

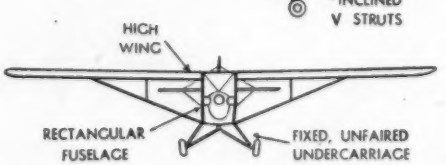
The Grasshopper really came into its own when the Taylorcraft and other makes were given the chance to show their paces during extensive army exercises in the swampy parts of Louisiana and in Texas not long before the Japs plunged down on Pearl Harbour. Impressed by the ability of these little machines to take-off and land almost anywhere—even on an ordinary road or a farm meadow—the U.S. Army Staff promptly decided to order large numbers of them for liaison and light communications, and the advent of war saw the Civil Air Patrol—a similar organisation to our Civil Air Guard except that it was allowed by the authorities to do something useful—flying them over the Western Atlantic on submarine patrol in much the same way as Tiger Moths and Dragons were used on "scarecrow" patrols over the English Channel and the North Sea by the R.A.F. in the early days of the war when we were very short of Coastal Command aircraft.

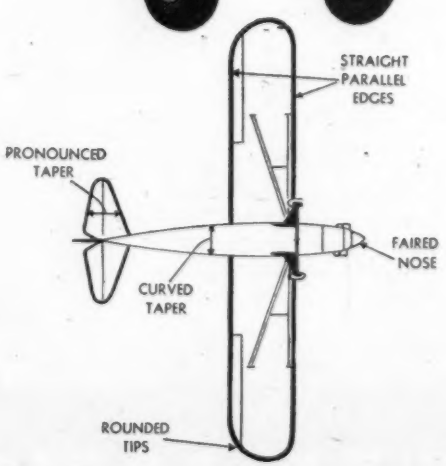
Taylorcraft are also manufactured in Great Britain under licence from the American corporation, two types being produced, namely, the Model C, with the 65 h.p. Lycoming "flat-four" air-cooled engine, side-by-side seating, and either stick or wheel control, and the Model D, which is similar in general arrangement except that it has the 90 h.p. Cirrus air-cooled four-cylinder-in-line engine and provision for parachutes. This model, called the Auster, is in service with the R.A.F. The American Taylorcraft is produced with both side-by-side and tandem seating arrangements, and Lycoming, Continental and Franklin horizontally opposed engines of 65 h.p. are variously fitted.

Taylorcraft with 65 h.p. engines have a top speed of 110 m.p.h., cruise at 90 m.p.h., and land at 35 m.p.h. The Cirrus-engined model has a top speed of 125 m.p.h., cruises at 107 m.p.h., and lands at 40 m.p.h. The range is about 300 miles for both types.





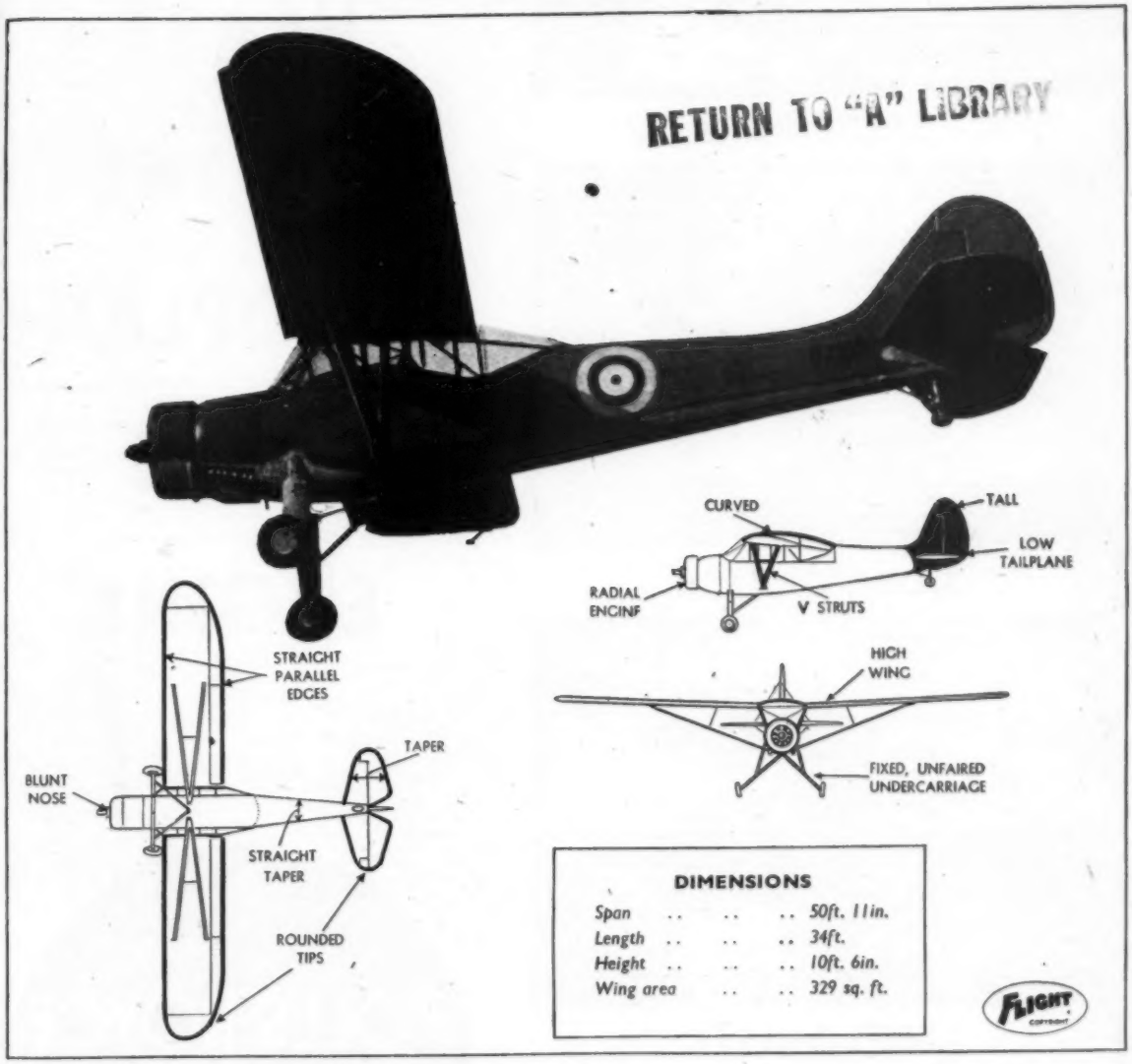

**DIMENSIONS**

| | |
|---|---|
| *Span* .. .. .. | *36ft.* |
| *Length* .. .. .. | *22ft.* |
| *Height* .. .. .. | *6ft. 8in.* |
| *Wing area* .. .. | *168 sq. ft.* |

FLIGHT COPYRIGHT

# dheir Characteristics

## VULTEE VIGILANT (O-49A)




AMONG the lighter types of American aircraft in service with the R.A.F., the Vultee Vigilant may be compared operationally with the Fieseler Storch, though it has an appreciably higher top speed at 122 m.p.h. than has its German rival.

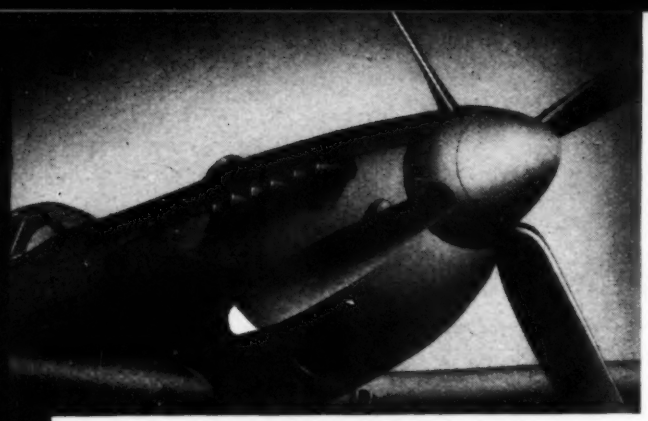
Known in the U.S. Army Air Force as the O-49A, the Vigilant—a Stinson design—is definitely outside the Grasshopper class (although it also has a very low landing speed of 31 m.p.h.) inasmuch as it is powered by a Lycoming air-cooled radial engine rated at 280 h.p., with 295 h.p. at 2,300 r.p.m. for take-off. Actually its weight is some three times that of a Grasshopper and its overall dimensions are very much greater.

Designed to a specification for a two-seater short-range Army Co-operation aircraft for contact work with infantry, the Vigilant is fitted with high-lift slots along the entire leading-edge of the wing and plain hinged trailing-edge flaps. The high, strut-braced wings are built up of aluminium alloy spars and ribs and covered from the leading-edge to the front spar with light aluminium alloy skin, the rest being fabric covered.

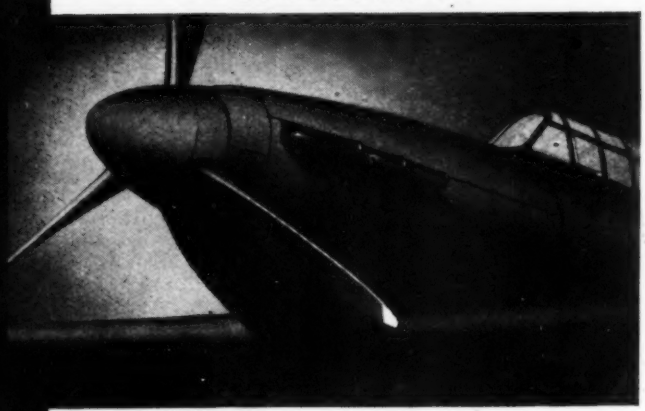
The fuselage, which provides excellent visibility in almost every direction, is constructed of welded steel and is fabric covered, the same system being also applied to the tailplane. It has a cruising speed of 108 m.p.h., climbs at 1,160ft./min., has a range of 350 miles and a service ceiling of 20,000ft. In common with its smaller relative, the Grasshopper, no armament is carried, as it is only intended for rearward communications where it is presumed the sky will be free from enemy aircraft.

Its speed range is excellent, and it can take off with a 75 yd. run, clear a 50ft. obstacle in 130 yds., and has a landing run of less than 50 yds.

First produced in 1940 for the U.S. Army Air Force, the Vigilant was the first Stinson design for military purposes, so it is not surprising that it bears many of the characteristics of the long line of Stinson civil monoplanes in its design. The first Vigilants for the R.A.F. reached this country in the autumn of 1941, and to these have been added those with the U.S. Army squadrons over here, so that altogether there is a considerable number of the type flying about Great Britain at the present time.

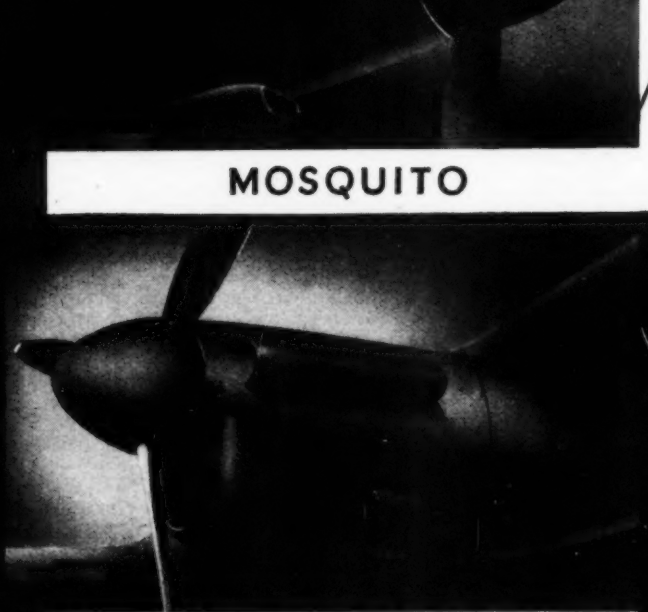


SPITFIRE IX



HURRICANE II

MOSQUITO



LANCASTER

# "THE HEART OF THE AEROPLANE IS ITS ENGINE"

ROLLS-ROYCE

*Merlin*

AERO ENGINES

FOR SPEED AND RELIABILITY

*Notes from a Test Pilot's Diary—No. 4*

# Boost Surge

## *A Fairly Infrequent Trouble, Its Detection and Cure*

By "WITNESS"

THE previous article dealt at some length with boost leaks and the effect of sticking boost control, which are common problems in test flying. This time I intend to examine some of the less frequently occurring boost troubles.

Boost surge seems to crop up from time to time during series production of almost any type of engine, although generally, in my experience, air-cooled radials seem less prone to this malady than liquid-cooled in-line engines. The symptoms of surge are unmistakable, as the note of the engine goes up and down like a siren sounding the alert, with the boost alternately rising and falling. The tendency for the fault to develop can sometimes be noticed during the run-up, becomes most pronounced at take-off, and then will often iron itself out on the subsequent climb.

The cause on a new engine may be swarf or dirt in the boost-control mechanism; roughness of movement in the links, or tightness of the boost-control piston. The cures in all these cases are obvious, and in addition an improvement can sometimes be obtained by opening out the hole in the piston when over-sensitiveness is suspected. With an old engine there are the added possibilities that sludge and dirt may be causing uneven movement of the piston, and that backlash may occur.

### Engine or Airscrew?

Engine makers have occasionally been reluctant to admit that their engines could possibly surge, and on hearing the unmistakable sound have attributed the phenomenon to hunting of the airscrew constant-speed unit. The fact that the pilot reports a fluctuating boost and fairly steady r.p.m. is not always quite believed, especially when the aircraft in question happens to be a single-seater, and there is thus no one to support his evidence.

Proof that boost surge really *is* boost surge can be given quite simply if the engine has a boost cut-out. The procedure is to pull and lock the cut-out so that the pilot operates the engine through a "straight" throttle. He then takes off, being careful to open up only as far as will give maximum permitted boost, and if no surging sounds are heard it follows that the elimination of the boost control unit has cut out the trouble and therefore constant-speeding of the airscrew is blameless.

It is always a matter of surprise to some that boost control works so well, even when the exigencies of war-time production tend to increase the tolerances to which this delicate form of mechanism is made. For an aneroid capsule to govern the maximum permitted boost between ground level and the maximum power altitude by expanding a bare half-inch, and to do so progressively and smoothly throughout, is a remarkable achievement. Trouble with the aneroid itself is rare. Occasionally the capsule collapses, with the result that the internal spring forces it out to the maximum dimension and gives the same effect as a "straight" throttle.

Trouble sometimes arises through imperfect exhaustion of a capsule, and consequently there is a rather pronounced response to a temperature rise by the residual air. This causes the capsule to elongate with the hotter working conditions during flight, as well as with reduction in atmospheric pressure at height as intended. Hence it will be found that the maximum boost readings at heights below the maximum power altitude tend to exceed the accepted limit. One may have to allow a tolerance of about $\frac{1}{2}$ lb. for this, as it would be expecting too much to have all capsules exhausted to the point where there is virtually no temperature response.

### Gauge Accuracy

On the other hand, with the original Merlin III there was always a tendency for the maximum boost datum to fall off slightly in flight. In fact, the original maximum boost setting of 6 lb. was increased to $6\frac{1}{4}$ lb. so that with a ground setting of the latter figure one could be sure to obtain 6 lb. in flight. The reason for this variation has never been fully explained, although there was a theory that it was due to difference in expansion rates between the material of the boost piston and that of the boost cylinder. However, a change of material specification to give greater similarity of expansion coefficients did not entirely overcome the difficulty. The matter was never really serious because the variation was so small, and anyway one cannot expect a boost gauge to be much more accurate than $\pm\frac{1}{4}$ lb.

On some multi-engined installations, where the boost line is of necessity a long one with several joints, there is sometimes found in full-throttle level flight an effect which, from the fluctuation of the boost gauge, appears at first to be a form of boost surge. Surge, however, can usually be discounted if there is no rising and falling in the note of the engine (which may be hard to recognise against the background of three other engines). The cause of this trouble is quite often a boost leak in the neighbourhood of the fireproof bulkhead, due to a joint in the boost line opening and closing with the flexing of the engine mounting.

## CAPT. BALFOUR IN S. RHODESIA

HIGH tribute to Southern Rhodesia's part in the Empire Air Training Scheme was paid by Capt. Harold Balfour, Under-Secretary of State for Air, who arrived in Salisbury on April 6th, on a short visit to the Rhodesian Air Training Group, at the invitation of the Southern Rhodesian Government.

Southern Rhodesia's effort, said Capt. Balfour, was out of all proportion to her size judged by population, and her contribution in training airmen was substantial in numbers and first-class in quality.

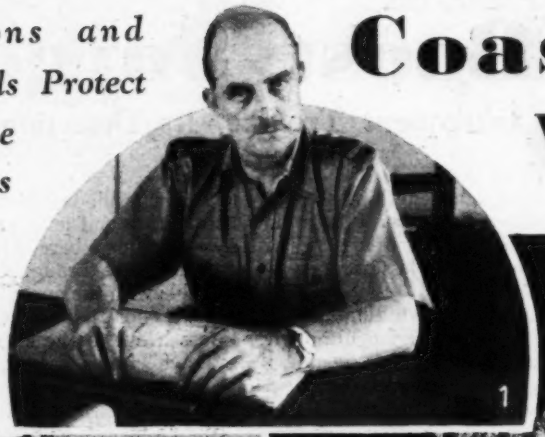
"The spirit of determination and co-operation which has been evidenced by the Southern Rhodesian Cabinet, by the Headquarters of the Southern Rhodesian Air Force, and through all ranks of the Air Force, is something not measurable by statistics, but can only be expressed in terms of real gratitude, appreciation and admiration. In my several years of Ministerial administration, on behalf of the Secretary of State, of the Empire Air Training Scheme, I can never recall a single instance when anything we asked of Southern Rhodesia was not met with ready response and the utmost willingness."

On behalf of the Air Council Capt. Balfour expressed "warm gratitude to the private citizens for their unbounded hospitality and constant kindness to R.A.F. personnel in their homes and everywhere they have met them."

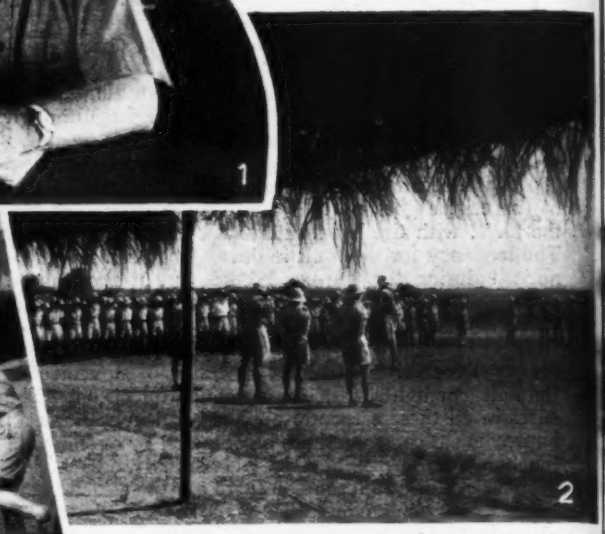
In addition to training, Capt. Balfour added, Southern Rhodesia was also manning and maintaining Rhodesian units in the field in accordance with the finest traditions of the Royal Air Force in the standard they had achieved.

# Coastal Co
# West Af

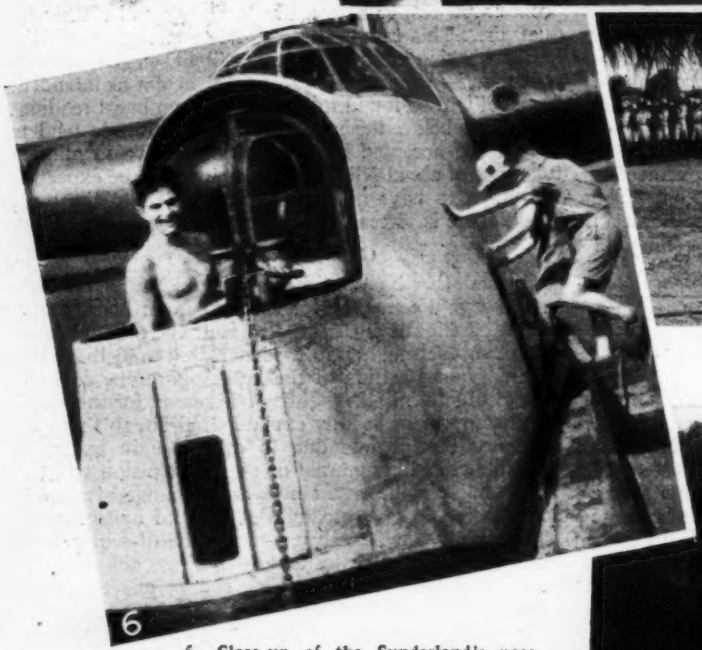
*Seafoxes, Hudsons and Turreted Sunderlands Protect Shipping Lane to the Cape and Across South Atlantic*



1. A.O.C. West African Command. Air Vice-Marshal J. B. Cole-Hamilton, C.B.E., at his desk at Air Headquarters.



2. The A.O.C. addresses the officers and men during a visit to one of the stations under his command.



6. Close-up of the Sunderland's nose showing how the power-operated gun turret is retracted into the hull in order that the mooring tackle can be conveniently used.

7. In tropical surroundings a launch operates a shuttle service to and from the flying boats and the beach.

THE ever-increasing range and numbers of German submarines means ever-increasing responsibilities on the shoulders of Coastal Command. The shipping lanes of both the north and south Atlantic oceans, the northern route to Russia and the southern route via the Cape are now all open to under-water attack.

Coastal Command, as one entity, operates throughout the year in temperatures which vary from sub-zero to tropical. Convoys to be protected are sometimes over 750 miles from the base where the aircraft take off.

For most of the crew life is a dreary business of round-the-clock patrols over watery wastes, but for the navigator who has to find a pin-point on an ocean face or make a perfect landfall the work is terribly exacting. Its very monotony is likely to defeat its own object, for it is only by keeping continual vigilance that the crew can be ready to handle an attacking aircraft or depth-charge a crash-diving U-boat.

3. Big Claus and little Claus. A Short Sunderland and a Fairey Seafox up on the slipway for overhaul. The Seafox was designed as a light reconnaissance machine for catapulting from cruisers.

4. A general view of the station showing the slipway and sheltered anchorages. There are two Sunderland IIIs on the tarmac and one at its moorings.

5. The formal briefing of flying boats' aircrews before take-off on an anti-submarine patrol.

# Comand
# Arica

**8.** This picture of a Sunderland III flying along the West African coast shows clearly the excellent field of fire of the nose, tail and dorsal turrets.

**9.** The aircrew of a Hudson leaving their machine after a patrol.

**10.** Hot to the bare feet. Refuelling a Hudson ready for the next trip. Only a West African could bear to stand on a metal wing in tropical sunshine.

*Topics of the Day*

# Tricycles Then and Now

## *How Ideas Have Changed with Added Experience of the Tricycle Type : Present-day Technique : The Advantages of the "Straight Running" Characteristic : Difficulties and Dangers*

A FEW days ago I came across an old reprint of an article which was penned—to use the Bramah manner—by this unworthy scribe in the days of "peace." There were only a few wars going then—markedly in China and Spain—and nobody was bothering very much about the ugly possibilities.

The article was, in fact, about tricycles and their various advantages. It dealt with centres of gravity and directional stability, and was, if I remember correctly, written soon after my first experiences with this type of undercarriage on a quaint little machine known as the Scheldemusch. At that time mine was the lesser of two voices crying in the wilderness on this distressing subject which, if then treated seriously, would have involved the most expensive drawing-board work before any new type of aircraft could be produced. The other voice has, unhappily, been stilled for ever—but not before its owner had had all the chance he wanted of trying out this type of undercarriage when fitted to the size of aircraft he had in mind when he wrote so vigorously and amusingly about this and many other aeronautical matters.

It still seems curious to me that this country's designers haven't made more use of the tricycle system. With one exception in the medium and larger classes, the whole of the development work has been left to the Americans. Admittedly, it is difficult and even dangerous to start experiments on new lines when a country has its back to the wall and when all efforts must be directed to the job of producing more and more aircraft, even if these cannot have all the fads and fancies which might or might not be ultimately successful.

When I wrote that article I named a number of advantages which have not turned out to be so very important, and I also overlooked a few disadvantages which may yet prevent this undercarriage layout from becoming universal. For instance, I stressed the ease of landing, particularly in the dark or in bad visibility, and suggested that shorter landing runs would be possible because the brakes could be applied firmly as soon as the machine was down. I believe I even mentioned that the take-off could be shortened by the simple expedient of getting up a certain amount of speed before turning into wind! Aircraft in those days didn't require the same amount of concentrated thought before opening up; imagine doing the "drill" while dashing round the perimeter track at 50 m.p.h.!

### Two-point Landings

As it happens, the present technique, with both large and small machines, is to hold off as long as possible in the ordinary way and to keep the control column back while landing. The enforced tail-down drag offers better "slowing-down" forces than any brakes can be expected to offer, and the whole process reduces both the load on the nose-wheel and the wear on the all-important tyres. Shortest runs are *not* made by placing the aircraft firmly on the deck and applying the brakes; good old-fashioned aerodynamic drag still leads the way.

Of course, the tail cannot be held down after the main wheels have touched, but the idea is to lose as much way as possible before the aircraft lands, and then to apply brakes in little bursts as and when it is considered necessary. This applies particularly to fast-landing and heavy aircraft, in which the tyres and brakes are working very nearly at their maximum capacity. The important point is that, for instance, if the slowest landing speed (i.e., the slowest at which the aircraft can be held off the ground by use of the elevators) is 90 m.p.h., then the actual distance covered while reducing the speed from 110 m.p.h. is less when airborne than when dashing along in a "no-drag" attitude with the tyres screaming. Needless to say, the bad-weather advantage is still there—a tricycle *can* be lobbed firmly on the ground at any reasonable speed when conditions necessitate such an action, but it is not the normally recommended one or even the most efficient from the slowing-down point of view.

The technicians may dispute the claim—and I must bow to their superior knowledge—but I feel fairly certain, too, that a tricycle's take-off is better, wing-loading for wing-loading. From visual measurements, the actual load doesn't make a great deal of difference—a matter of a hundred yards or so between the length of "light" and "heavy" runs. The reason for this seems to be fairly obvious, and is the reverse of the landing picture. The very fact—lack of aerodynamic drag—which makes the tricycle's landing run somewhat long, makes its acceleration phenomenal. And load, except that it increases the necessary take-off speed by a few miles an hour, does not affect this acceleration to the marked extent that it affects a machine in which the tail must be forcibly lifted and held up. I've often wondered how much power is used in that antediluvian process.

### Tricycle Steering

From the pilot's point of view the real joy of the tricycle is the way in which the aircraft runs straight on the take-off and after landing. In that article I talked a lot about the "natural" anti-swing properties of the tricycle, both in the ordinary way and in cross-winds, and tried to explain it all with the aid of little diagrams. We won't go into all that now—even if I were capable nowadays of such an effort of reasoning—but I never realised then quite how important this straight-running characteristic could be in aircraft quite a little heavier and more complicated than those I used to fly in the years of peace.

In the very best of multi-engined "conventional" aircraft, the process of getting the tail up and keeping the thing straight during the take-off run involves an enormous amount of juggling with rudder, brakes and throttles. With a cross-wind tending to head the machine in the direction in which it is already, by reason of torque, trying to swing, it is not unusual for the outfit to be half-way down the runway and nearly airborne before it is possible to bring up the power of one or other of the outboard engines. And how often, even in well-behaved medium-sized twins, has it been necessary for us to pull one of the throttles sharply back for a second in order to check a swing which has been allowed to get out of hand? The tortuous movements of one's throttle hand must be a source of amazement to the uninitiated, who probably imagine that it is all a kind of "line," like the continuous jagging of the wheel by certain pseudo-racing motorists. With modern self-centring tail-wheels, the landing process isn't quite so hectic, and most machines run fairly straight unless and until they develop a really startling swing—and then nothing but Providence and a good strong undercarriage will save you. It is the pilot's job to prevent that swing from even starting—hence his itching brake-thumb immediately after touch-down.

None of this worries the tricycle driver. One has a few seconds of initial unhappiness while, with bursts of engine and touches of brake, the pirouetting nosewheel is finally straightened out. Once the machine is running true, the two or four throttles can be opened to maximum boost

## TRICYCLES THEN AND NOW

in one reckless swoop and the whole contraption dashes down the runway, cross-wind or no, as straight as an arrow—or as straight as an arrow would go if the archer could apply just a shade of rudder bias during its flight. Generally speaking, tricycles must be *made* to fly; at a predetermined airspeed figure the nosewheel is lifted firmly from the ground. The landing is even simpler once the pilot has lived down his initial doubt about the "downness" of the nosewheel as the machine lurches forward; the aircraft just doesn't want to go off the straight, and quite a lot of braking effort is needed to turn at anything but a walking pace. Which is a good thing.

But let us not be too optimistic or too certain. Whereas a shimmying tail-wheel is of comparatively small importance and even its complete failure will damage nothing but the rear part of the aircraft, a shimmying or failing nosewheel can be very unpleasant indeed—particularly as braking merely accentuates the shimmy, and braking is entirely necessary if one is to stay on even the longest runway. One can take comfort from the facts that even a nosewheel failure is, judging from experience so far gained, by no means as lethal as casual thought would suggest, and that, because of its importance, designers have taken a great deal more trouble with the layout and damping of this wheel than they have with the poor, often forgotten tailwheel.

Probably the most difficult problem of all is that of load distribution, though this has not proved to be as difficult as might have been imagined. After all, the sort of loading which would make a tricycle difficult to handle on the ground is likely to be one which would make any aircraft dangerous in the air. One just has to be more careful. The most lethal error—that of getting the c.g. so far forward that the aircraft cannot be levered off the ground at any reasonable speed—is not likely to be made.

As I've remarked before, I don't necessarily think that the nosewheel arrangement, as we see it, is the final version, but I think that the principle of the forward castoring wheel or wheels is likely to become universal—at least on really large aircraft. Imagine the job of keeping a hundred-tonner straight on take-off—and imagine the effort of lifting the tail of such a machine.

"INDICATOR."

# Transatlantic Fighters

### *Long-range Lightnings Now Fly to Britain and Other Battle Fronts*

LOCKHEED Lightnings, which until a short while ago were crated and shipped by sea, are now being flown by the U.S. Army Air Force from America to Great Britain, North Africa, and other battle fronts, according to a recent message from Dayton, Ohio.

The message goes on to say that other American fighter types, such as the P-47 Thunderbolt and the P-40F Warhawk "have extra fuel tanks which greatly increase their ferrying and combat range even to the point of overseas ferry travel." From this the reader is invited to infer that these two types are also being flown across the Atlantic, though it avoids actually saying so in as many words.

That long-range fuel tanks have for some time been fitted, when required, to these and a number of other fighters will be no news to readers of *Flight*, but this is the first release of news that the U.S. Army Air Force stationed in the European theatre of war is now bringing over its P-38 fighters under their own power, and the saving in time, not to mention risk of loss when compared with the hazards of the U-boat infested seas, will obviously be very considerable.

At Wright Field, Dayton, regular air transport communications with Tunisia are also organised, large amounts of equipment being taken right up to the front line by air.

"Jeeps, field guns, petrol, extra engines, small tanks, cranes, hospital facilities, fully equipped machine shops, portable landing fields, and many other items of equipment are delivered by air within a matter of hours after an advanced position has been occupied," the message continues.

## TRADE AND AIR TRANSPORT

### *Institute of Export Discusses Post-war Possibilities*

ALMOST everything that has already been said, times without number, about post-war flying was repeated by four speakers at a meeting held by the Institute of Export at Kingsway Hall, London, last week, when the chair was taken by Dr. Stanley Walpole.

The principal speaker was to have been Viscount Bennett, former Governor-General of Canada, but the chairman announced that, owing to reasons which he was not at liberty to disclose, Lord Bennett would not be able to give his address which would have dealt with the Empire aspects of the air transport problem.

Nevertheless, there were few angles of the subject which were not covered by those who did speak, and the most significant point upon which all four of them laid emphasis was the imperative need to tackle the problem at once.

Dr. Walpole said there was no escaping the fundamental truth that without exports this country would surely die, and he enumerated the many reasons why the export trade of Great Britain would depend to a far greater extent than many people realised on an efficient system of air transport linking this country with her potential markets overseas, and particularly those of the British Empire and the United Nations.

Major General Sir Frederick Sykes, M.P., a former Chief of Air Staff and Controller-General of Civil Aviation, discussed the weaknesses of the present situation and said he did not foresee any cut-throat competition between air transport and sea and land transport. Air transport would, in fact, be an essential adjunct to the other two and would be reserved for passengers and goods demanding speed. One of our main problems when peace returned would be avoiding a clash of interests with America, which had spent many hundreds of thousands of pounds on research in aircraft design and was at present producing thousands of transport aircraft, while we, of necessity, were concentrating upon fighters and bombers. It was absurd to think we could rely on converted bombers, and we must give more attention than we were doing at present to the planning of our air transport of the future. The leading aircraft firms should be helped in their development work. An Empire policy was the first step towards an international agreement. He believed in a policy of freedom of the air, but that freedom would have to be very carefully defined. Monopolies and hidden subsidies he regarded as unhealthy.

Mr. F. W. Farey Jones said that it was what we forced our Government to do *now* that would matter. Once again the writing was on the wall; the last time it was German aerial rearmament, and this time it was air commerce.

"The only subsidy I would like to see," he added amid applause, "would be a free ticket for every schoolboy and girl to some part of our Empire so that they may see and learn to understand the heritage which is theirs," and he concluded by asking for the immediate formation of an Empire Air Council.

Saying that for 300 years Britain had fought for the freedom of the seas, and now she, and the United Nations, must fight for the freedom of the air, Capt. F. J. Bellenger, M.P. (Lab.) thought our trouble was that we did not know what we wanted, whereas the Americans did. "My only interest in air transport as a politician," he added, "is in seeing that we put our house in order, and the instrument for that is the British Government."

Finally, Mr. E. C. Gordon England said the subject was as simple as it was big. There were three fundamental methods of transport—vessels, wheels, and wings—and he quoted figures to show how all three could continue to develop simultaneously.

# Russian Air Force Leaders

## *The First Marshal Appointed : The New C.-in-C. : Famous Arctic Flyers Serve With the Air Force*

FOR the first time in the history of the Soviet Air Force the appointment of an Air Force Marshal was announced on March 17th, 1943.

In January, 1943, with the appointment of General Nikolay Nikolayevitch Voronov, who was in charge of artillery operations in the battle for Stalingrad, to the rank of Marshal of Artillery, the Soviet Government initiated this rank for the separate branches of arms. It was natural that this recognition should go first to artillery, for the latter is regarded in Russia as the mother of all branches of service.

### First Marshal

Now the Soviet Air Force has received its first Marshal. The first Air Force General upon whom this high rank was bestowed is Alexander Alexandrovitch Novikov, who, together with Lt. Gen. F. I. Palalayev, conducted the Air Force operations in the Stalingrad sector and contributed effectively towards the annihilation of the German Sixth Army.

Air Marshal Novikov has had a remarkable career. On June 5th, 1940, he was appointed Major General. Within the following two years he was promoted to Lieutenant General of the Air Force.

In recognition of Novikov's brilliant leadership in the Stalingrad operations he was promoted on January 18th to Colonel General of the Air Force, and on January 27th, 1943, awarded the highly coveted decoration of the Order of Suvorov First Class. It is noteworthy that, in his rapid career, Novikov overtook other Air Force Generals older than himself.

On February 3rd, 1943, when two Deputies were appointed to the C.-in-C. of the Soviet Air Force, Novikov was given the highly responsible position of the First Deputy Commander, while Lt. Gen. Ivan Feodorovitch Petrov was appointed Second Deputy Commander.

It is now understood that Air Marshal Novikov has been entrusted with the supreme command of the Soviet Air Force.

Marshal Alexander Novikov.

Until the outbreak of the war, few of the Soviet Air Force Generals were known outside the Soviet Union. The only Air Force officers whose fame spread outside the frontiers of Russia were pilots who became known because of their long-distance and non-stop flights, notably over the Arctic.

Even in peacetime great attention was paid in the Soviet Union to the development of aviation, not only because of the importance of civil air communications, but equally because of the decisive role to be allotted to the Air Force in the event of war. Pilots who had accomplished record flights were very much honoured and held distinguished positions in the Soviet Union. With the outbreak of hostilities famous Russian pilots became Commanders of Air Force units.

### Long-range Pilot

The most famous among them is Mikhail M. Gromov, the Arctic flyer. His connection with aviation began in 1917, when at the age of 18 he received his pilot's licence. In 1927, he worked in Plant No. 1 of the Stalin Aircraft Works in Moscow, and ever since his name has been closely associated with the development of Russia's aviation. In 1937 he was the first pilot of the Soviet Ant 25-1 monoplane which made the record-breaking flight from Moscow to San-Jacinto, California, a distance of about 6,570 miles.

Shortly after the outbreak of war Gromov led a Soviet commission to the U.S. composed of 47 Russian officials, mainly technical experts. They arrived in the U.S.A. by air via Nome, Alaska, and according to reports their object was to study American methods of military aircraft production. It will be remembered that in October, 1941, Gromov visited this country on his return journey to Russia ; the next year he took part in operations against the *Luftwaffe* on the Russian front as Major General of the Soviet Air Force.

During the winter of 1942 Gromov's units took a distinguished part in close-support operations of the Russian ground forces. His skilful leadership enabled his units to inflict serious damage on German rail communications and telegraph lines, and to destroy 49 fighters and 16 transport aircraft in one sector of the front.

Perhaps even more popular abroad

Lt. Gen. Ivan Feodorovitch Petrov.

Maj. Gen. Mikhail M. Gromov.

Maj. Gen. Georgiy F. Baidukov.

RETURN TO "A" LIBRARY



## RUSSIAN AIR FORCE LEADERS

was the famous Russian flyer Valery Chkalov, who accomplished the well-known first non-stop flight, Moscow-Vancouver (near Portland, U.S.A.). The son of a working family (his father was a minor railway employee and his mother worked as an office cleaner), Chkalov became an example to the flying youth of Russia.

Chkalov himself was killed on December 15th, 1938, while testing a new aircraft, but his two associates, his co-pilot and his navigator, are at present serving with the Soviet Air Force.

The two men are Georgiy F. Baidukov, nicknamed "the god of blind flying," and Alexander V. Belyakov. Both are men with experience accumulated in their joint ventures, such as their flight from Moscow to Warsaw and Paris in 1934, the non-stop flight from Moscow to Udd (now named Isle of Chkalov) via Petropavlosk on the Kamchatka, and the already mentioned record-breaking trip to the States.

Baidukov, who is 36 years old, was appointed Major General of the Air Force in March, 1943; Alexander V. Belyakov, who is now 43, was appointed Major General in June, 1940.

Maj. Gen. Alexander V. Belyakov.

# In Parliament

## *Lords Debate on the "Short" Affair : Post-war Fate of the Firm's Shares Still in Question : No Explanation of Minister's Action*

THE acquisition by the Minister of Aircraft Production, Sir Stafford Cripps, of the shares of Short Brothers, is still a leading topic for discussion in and out of Parliament, and it was the subject of a lengthy debate in the House of Lords last week. It cannot be said, however, that the result produced anything very definite, and least of all did it produce any assurance by Lord Sherwood, who replied for the Government, that the expropriated shareholders could look forward with confidence to complete reinstatement after the war.

It was Lord Teviot who raised the matter, and he began by at once making it clear that what he chiefly complained of was the fact that the Minister of Aircraft Production had not, up to then, given any satisfactory explanation as to why he had found it necessary to take over the company's shares in order to get efficient management. He had, he said, discussed the point with a great many people, and he had so far been unable to discover why such a course should be necessary whatever commodity a company might be producing.

"If the Minister could show us, or even tell us," he said, "that this information is inadvisable because it would be giving information to the enemy, one would immediately drop the question."

Remarking that he himself had not, and never had had, any personal interest in the shares of Short Brothers, Lord Teviot said that he was not criticising the Minister's action in taking over the *management* of the undertaking; the question he raised was that of taking over the *shares*, which he looked upon as establishing a very dangerous precedent. It had caused considerable alarm and concern in the business and financial world.

"It is well known to your Lordships," said Lord Teviot, "that the privileges of the trade unions, which have had to be interfered with during the war, are going to be restored in their entirety after the war. I can see no reason why any business or affairs which have been interfered with owing to the war, where the interference has been necessary to the war effort, should not similarly be reinstated if all the privileges of the trade unions are to be returned after the war.

### An Analogous Case

"We have, I think, an analogous case to this one in the railway companies. The Government came to the conclusion, quite properly I think, that they could not expect the railways to run efficiently during the war, in view of the immense amount of business that the Government would necessarily give them, but the Government did not take the shares of the railway companies. They came to a very amicable and successful arrangement on the financial side with the railway companies, and I can see no reason why the same sort of arrangement cannot be made with all companies the management and general conduct of whose business it may be found necessary to take over—that is to say, the production side of companies.

"I have looked up the record of dividends of this company, and I find that since they became a public company in 1936 they paid substantial dividends up to 1941. They have paid rather less dividends during the war than before the war. Surely it would be quite easy to go to the company and to the shareholders and say:

"'We are going to pay you during the war, while we are managing your company for you, a certain dividend—shall we say an average dividend such as that which you have been accustomed to receive?' What is the Government's position going to be after the war in this particular case and the cases of other companies that may be dealt with in the same way?

"I do not think I am exaggerating when I say the Government will find themselves in possession of a competitive commercial undertaking. What are they going to do about it? There is no mandate from the country for such an operation. I do not believe that the House of Commons appreciated that under Defence Regulation 78 the Government were given authority to take over a business and run it in a competitive manner after the war. The Prime Minister has reassured us on this matter up to a point in a statement made the other day, when he said that the Government would never think of introducing anything of the sort I have indicated. But in my view, and in the view of a great many other people, that is what has, in effect, happened in regard to this particular company.

"I do not believe the people of the country generally or the House of Commons had any idea of such an eventuality arising out of this particular Regulation, and I believe that if they had had such an idea at the time when this Regulation was passed through the other place it would not have had their consent. These remarks apply, of course, to any other organisation which is operating and helping the country during the war. If the same thing happens in regard to other companies, the result will be that which I have described accurately.

"Finally, I want to ask the noble

## IN PARLIAMENT

Lord who will reply to give us an answer to the questions I have raised, and particularly give us an assurance that any business or undertaking which has been taken over in order to assist the war effort will be reinstated in its business when peace comes, in exactly the same way as it has been decided that the trade unions are not to suffer but are going to be reinstated in all their privileges after the war is over."

### Two Special Aspects

The Earl of Listowel supported the action of Sir Stafford Cripps, and said that public interest had fastened upon two special aspects of the case, namely, whether the Government had behaved in a perfectly fair and reasonable manner towards Short Bros. and whether it was not a vitally important matter of principle that in wartime the Government should acquire the same compulsory powers in relation to capital as it had in relation to labour. Such control would show that no section or class interest could be allowed to interfere with the war effort, and he thought it was most important for the public to realise that Parliament would deal equally drastically with any section of the community that put the brake, even to the smallest degree, upon our war production.

"The noble Lord said he did not take exception to the Government taking over the management and control of this firm, but what he did object to was that the Government should acquire the financial assets of the business.

"But the capital assets of a firm and its management are interlocked. The right to appoint directors lay with the shareholders, and the Minister was therefore obliged to acquire their interests in order to acquire the right of appointment to the board of directors.

"This expropriation of the shareholders of Short Brothers does not show any wanton interference with private property. It was necessary in order to establish full legal control over the affairs of the company."

Pointing out that the long-term prospects of the firm might not prove to be so rosy as the immediate future, since aircraft manufacturers would hardly continue on their present gigantic wartime scale when peace returned, the Earl of Listowel suggested that it should be some solace to the Short shareholders that whatever might be the possibility of a lost chance of improving their position in the near future, they were also protected against any loss they might have sustained at a later date, and he then went on to say:—

"It has also been suggested, and I am not sure whether it was not in the mind of the noble Lord opposite, that this action of the Minister is the thin edge of the wedge of nationalisation. The Prime Minister dealt very effectively with this argument in the course of some remarks he made at question time in another place. He pointed out that public control of the aircraft industry, whether producing for military needs or for civil purposes, was a matter of broad general policy which must be referred to later. It rather astonishes me that anyone should have so little confidence in his own political leaders as to imagine that they would nationalise industry under the cloak of Defence Regulations."

Lord Brabazon said that he was sorry to see the individuality of Short Brothers disappearing because, though never a shareholder, he had been deeply attached to the firm, and the three brothers who started it, throughout its whole history.

### Tried to Help Them

Intimating that the terrific wartime expansion of the industry and the influx of new workers who had no general training in aircraft work was a big factor involved in the difficulties encountered by the firm, Lord Brabazon said that when he was at the Ministry he tried to help the firm all he could, but things got no better, and it became obvious, considering the fact that the Government had put money into the firm equal to nearly three times their capital, that measures to improve production were imperative. Certain suggestions were made to them, but these were overruled by the board, and so the Minister had to appoint a controller.

"Having taken control of the policy of the firm," said Lord Brabazon, "what sort of position would he have been in unless he took over the firm, lock, stock and barrel? If he did not, he was going to lay himself open to charges of damage from the point of view of the effect of his action on the policy and prosperity of the firm.

### Future Possibilities

"It may be, I do not say that it is so, that this firm in the future is not going to make Short machines. If that were so, then it might well be claimed that the action of the Minister had affected the goodwill, and there might be legal action for damages in respect of such loss of goodwill. I see no reason to complain of what the Minister of Aircraft Production has done in this matter. The blame rested entirely on the directors of Short Brothers.

"To suggest that Sir Stafford Cripps is trying to nationalise the industry by a trick is a most unworthy suggestion for anybody to put forward. I do not believe it for one moment. Frankly, had I been in Sir Stafford Cripps's place I would have done exactly the same sort of thing."

Lord Brabazon wound up by expressing the opinion that it would be a bad mistake, after the war, to try and run a young industry such as aviation from Whitehall, because it demanded imagination, vision, and a willingness to take risks. They could nationalise the railways, electricity or gas if they liked because they were more or less standard and called for no great imagination. But if there was anything at all in our dreams and hopes of a different world, the aircraft industry would have a very big part to play in it, and he hoped they would do something to keep alive the individuality of the great creative firms such as Shorts, and preserve the team spirit and imagination they possessed

### Breaking Down Morale

Lord Kenilworth, chairman of the S.B.A.C., said he thought that criticism of the aircraft industry, the kind they were hearing, was breaking down the morale of managers, designers and workpeople, and he was certain that, if it went on the way it had been doing, a very great disservice would be done to the country. He would remind them that the tools with which the Battle of Britain was won were made by this industry, and, so far from being reproached, they should be treated rather as doing their job efficiently and well. Lord Geddes thought the Government had to take over the shares in fairness to the shareholders, under the special circumstances.

Most of the speakers devoted a considerable proportion of their time and eloquence to the question of whether Sir Stafford Cripps had been justified in taking over control of the firm, which hardly seems to have been the real point at issue, and Lord Sherwood repeated that the only way one could get control of a firm was by taking over the shares.

"I assure your Lordships that no other method would have achieved what is absolutely necessary at this time," he said.

Then, dealing with the real point at issue, namely, the refusal of the Government to give any undertaking about the return of the shares to their original owners after the war, he supported this attitude by drawing an analogy with lands taken over from farmers for airfields. The position, he pointed out, could not be compared with the railways, since they were not dealing with the whole of the aircraft industry but just with one weak part which had fallen down.

He reminded his hearers of the Prime Minister's assurance that there was no idea that this was taking over by nationalisation, or of keeping the shares which had been taken over because of this emergency, and he agreed with Lord Brabazon that if there was one thing that must have freedom, and which it would not necessarily be an advantage to nationalise, it was something like aircraft production.

# CORRESPONDENCE

*The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters.*

## TAILPLANE DIHEDRAL

### *Lateral and Longitudinal Stability*

A TAILPLANE set at a dihedral angle increases the lateral stability of the empenage, and therefore the torsional strains on the fuselage. The careful adjustment of the angle of incidence of the tailplane should be sufficient in a well-designed aircraft to effect longitudinal stability. The question of lifting the tailplane above the centre line of the aircraft depends on individual designs and the inherent longitudinal stability of such designs.

The whole object of the empenage of an aircraft is to maintain longitudinal stability; the elevator in the neutral position should not affect the longitudinal stability and the aircraft should fly "hands off" unless it is desired to climb or dive. The rudder in conjunction with ailerons and main wing dehedral are responsible for lateral stability which would be considerably affected by an empenage with a dihedral angle.

WILLIAM R. DAINTY (Capt.).

### *Nothing to Do with Vortices*

IN reply to "Hit and Miss's" letter on the raising of tail-planes, the dihedral angle has almost nothing to do with vortices caused by the engine nacelles, but was constructed to prevent side slip, or at least to cut it down.

Coming, however, to the lifting of the tail plane, what he said was right up to a point; but one of the main reasons for this is (a) to keep it out of the downwash from the main-planes, which could cause flutter and have drastic results (although the Whirlwind has an absolutely new type of tail-plane connection still secret). (b) It has also been found that the lifting of the tailplane sometimes cures an aircraft of bad spinning habits, the increased area *under* the tailplane acting as a balance. This idea was applied a little to the D.H. Don. The Blackburn Skua had an increase in fin area by placing an auxiliary fin under the fuselage, so preventing the lifting of the tailplane, which most probably would have meant a complete revision of design. By the way, I myself am only a groping but enthusiastic student.

To leave that subject. Why are the newsreels so fond of misidentifying aircraft? In a recent newsreel of the U.S.A.A.F. raiding the Renault works in France the announcer stated that only Fortress bombers took part in it, yet the camera showed a Liberator flying on our starboard side. "How come?"

CRITIC, 244 Sqn., A.T.C.

## TUGS AND GLIDERS

### *Rocket Assistance to Boost Performance*

IT has been one of my pet desires to see large, heavy gliders and special tugs in production. The Germans, who started all this troop glider business, have not gone far, and the best we can do seems to be confined to medium gliders like the Horsa, and others of which nothing must be said yet.

Now it is all very well to say that such and such an aircraft carries so much cargo and is fitted for glider towing as well. But how can the machine be expected to tow anything like a decent-sized glider and carry its load at the same time?

The obvious answer is to remove the glider-towing equipment from Wellingtons and other troop carriers, leaving them to their own job, and build a special tug aircraft for no other purpose. It needn't be elaborate. In fact, let it be crude, like the Ju 52; no smart undercarriages and so forth, just plain, straightforward strength, with three radial engines, good ones (Double Wasp or Hercules), and four-bladed airscrews.

Span should be about 90ft.; wing loading about 40 lb./sq. ft., length 60ft. or so, and there, roughly, you have a machine capable of towing about four heavy gliders (thirty-five men, including pilot) for long distances. It must not be forgotten that the gliders could be fitted with jettisonable racks to carry rockets to assist take-off. We could even have rocket-propelled gliders, released miles from their objective and pipping off a good deal faster than they could be towed. But that is another story.

However one approaches it, the fact remains that the troop glider cannot justify itself, even in its short life, unless it carries at least thirty-five men and doesn't dawdle on the way, as it seems to me that modern British and German gliders do. Naturally, the dawdling is due to the tug at present, but if we should try a rocket glider, the tug will, of course, assume secondary importance—a mere "helper off"—which is chiefly what my specification is aimed at.

The glider, fully loaded, would obviously require too many rockets for take-off, and would have none left for flight. However, the tug could pull three or four off at once, with the aid of auxiliary rockets on the gliders, take them to a suitable height (which the gliders could not reach themselves), and tow them about three-quarters of the way, when they could be released and make for their objective on their own.

I consider this a practical possibility, and would like to see other readers' views on the subject.

R. FANO.

## THE BEST TYPES OF AIRCRAFT

### *Fighter Firepower in lb./min.*

I READ with interest the correspondence in *Flight* of April 8th concerning the armaments of the Thunderbolt and the Spitfire, but the figures relating to the respective fire power of the two machines are wide of the mark. Below are the correct figures.

Thunderbolt with eight 0.5in. m.g.s (870 r.p.m. each gun) has a total fire power of 773 lb./min. (This applies to the latest version of the 0.5in. m.g.) Spitfire IXc with four 20 mm. cannon (600 r.p.m. each cannon) and four 0.303in. m.g.s (1,100 r.p.m. each gun) has a total fire power of 760 lb./min. (650 lb. from the cannon and 110 lb. from the m.g.s))

One correspondent who signs himself O. M. Etoe considers that the Spitfire III would have been better than the Mustang for Army Co-operation work. Probably he is unaware that Mustangs are now being equipped with Merlin engines, which gives the Mustang a speed equal to the Spitfire III. Recent photographs published in the Press show that the Mustang is now fitted with four 20 mm. cannon as well as 0.5in. m.g.s. which give a far superior fire power to that of even the Spitfire IXc.

J. L. COVERDALE.

## EXILE'S OVERTURE

### *In Defence of a "Distinguished Italian"*

HAVING known General Nobile in the past, and having the highest opinion of his personal integrity, we wish to protest against the insinuation contained in your issue of April 8th under the heading "Exile's Overture."

The premises on which your correspondent bases his case are incorrect. General Nobile is not an exile, nor has he just "returned from America to Spain." Between his return from Russia and his visit to America he was living in Rome. He came back to his country, with the diplomatic representatives and other distinguished Italians, when relations were severed between America and Italy. Since then he has already been on a lecturing tour in Sweden.

Nobile is known throughout Italy as an "*apolitico*"—that is to say, a man completely divorced from politics, too proud and too disinterested to make "overtures" in any quarter, even when the advancement of his own career demands them. His interests are exclusively in the scientific and technical side of aeronautics—to which he has made valuable contributions. He has good friends, both in this country and in America, and we may be glad that, in the dilemma which Italy's association with our enemies must have caused him, he has chosen the dignified course of taking a professorship in a neutral country rather than using his talents against us.

E. PRIBRAM,
F. M. BUSS.

[We are content to let Signor Nobile speak for himself. In the broadcast he is reported to have said "In this Europe tortured by war, Spain is an oasis of prosperity in all spheres. Spain is destined to have one of the highest posts in the New Europe. I add my voice for a more extensive rapprochement of the two great Latin countries, and I am sure that both will gain much from it."

One may be permitted the inference when an Italian celebrity speaks in Madrid, that the *New Europe* he refers to will be of the Axis variety.—ED.]

**AIR MARINES : U.S. Army Curtiss Warhawks (Packard-built Rolls-Royce Merlin engines) taking off from the deck of a carrier. The long-range fuel tanks beneath the fuselage are interchangeable with bombs.**

# SERVICE AVIATION

## *Royal Air Force and Fleet Air Arm News and Announcements*

## *Higher-Command Changes*

AIR MARSHAL F. J. LINNELL, C.B., O.B.E., Controller of Research and Development for the Ministry of Aircraft Production, has been appointed Deputy A.O.C.-in-C., Middle East. He has been succeeded as Controller of Research and Development oy Air Vice-Marshal R. S. Sorley, C.B., O.B.E., D.S.C., D.F.C., who was an assistant Chief of the Air Staff. Air Vice-Marshal Sorley will be promoted to the acting rank of Air Marshal and take Air Marshal Linnell's place as an additional member of the Air Council. The change took effect from April 20.

Before becoming the Controller of Research and Development at M.A.P. in June, 1941, Air Marshal Linnell was at the Air Ministry as Assistant Chief of Air Staff in charge of Training. Air Vice-Marshal Sorley will be remembered as oeing in charge of the Aeroplane Armament Experimental Establishment until June, 1941.

## *Promotions*

GENERAL DUTIES BRANCH.

Air Comdre. H. G. SMART, C.B.E., D.F.C., A.F.C., to be Act. Vice-Marshal. March 6th, 1943.

TECHNICAL BRANCH.

Air Comdre. (temp.) C. N. H. BILNEY, O.B.E. is granted the rank of Group Capt. (war subs.). February 4th, 1943.

## *Awards*

THE KING has been graciously pleased to approve the following awards in recognition of gallantry displayed in flying operations against the enemy :—

### Distinguished Service Order

Wing Cdr. R. C. M. COLLARD, D.F.C., No. 12 Sqn., awarded with effect from August 18th, 1942.—Since being awarded the D.F.C., Wing Cdr. Collard has completed numerous sorties. He first took part in attacks on Germany in August, 1940, and proceeded to the Middle East in November, 1940, when he took his squadron to Greece, to engage in attacks on Albania and Italy. Subsequently he served in Iraq and later in the Syrian campaign, before returning to the United Kingdom. On his last flight, while approaching the target area his port engine was hit by anti-aircraft fire and put out of action. Despite this handicap he proceeded to the target and dropped his bombs.

Act. Sqn. Ldr. E. B. PANTER, D.F.C., No. 70 Sqn., awarded with effect from August 15th, 1942. —Since the award of the D.F.C., this officer has completed a number of operational sorties and his success as a flight commander has been due to his fine example and devotion to duty.

Act. Flt. Lt. J. F. BARRON, D.F.C., D.F.M., R.N.Z.A.F., No. 7 Sqn.—One night in February, 1943, this officer was the captain of an aircraft detailed to attack Cologne. When nearing the target area his aircraft was held in a cone of searchlights and subjected to heavy fire from the ground defences. Despite this, Flt. Lt. Barron remained on his course, defying an intense and concentrated barrage, and pressed home a successful attack on his second run over the target.

### Bar to Distinguished Flying Cross

Act. Group Capt. J. C. MACDONALD, D.F.C., A.F.C., No. 15 Sqn. awarded with effect from June 15th, 1942.—Since being awarded the D.F.C. in July, 1940, this officer has completed many sorties. Throughout he has inspired his squadron by his skill, courage and zeal.

F/O. H. R. BAILEY, D.F.C., No. 85 Sqn.—Since the award of the D.F.C., F/O. Bailey has completed a very large number of flying hours. He has completed his duties with great skill and determination, often in extremely adverse weather. On one occasion he was pilot of a Sunderland flying boat when it was attacked by a Fw. Kurrier over the Bay of Biscay. The first burst of enemy fire killed one of the mid-gunners and rendered the rear turret useless. The aircraft was holed in many places, but, by skilful manœuvring F/O. Bailey continued the combat and drove off the attacker. On return to base, although the hull of the flying boat had been holed in many places below the water line, this officer successfully descended on the water without further mishap.

Act. Flt. Lt. F. D. J. THOMPSON, D.F.C., R.A.F.V.R., No. 7 Sqn.—One night in February, 1943, Wing Cdr. Mahaddie, Flt. Lt. Thompson and Flt. Sgt. Stewart were captain, navigator and flight engineer respectively of an aircraft detailed to attack Cologne. Whilst over the target area the aircraft was hit by anti-aircraft fire and attacked by an enemy fighter. The bomber sustained much damage. The aileron control cables were severed, causing the aircraft to fall into a steep diving turn and the wireless apparatus and the inter communication system were rendered unserviceable. By skilful use of the engines, Wing Cdr. Mahaddie regained control and set course for home. With great promptitude, Flt. Sgt. Stewart inspected the damage and, after reporting the position to his captain, rendered first-aid to the wireless operator, who had sustained a severe wound in the hand. Flt. Sgt. Stewart then did all in his power to assist his captain in flying the aircraft back to base, which was gained at the estimated time due to the superb navigation of Flt. Lt. Thompson.

### Distinguished Flying Cross

Act. Wing Cdr. T. G. MAHADDIE, D.S.O., A.F.C., No. 7 Sqn.—For citation see Flt. Lt. Thompson, D.F.C.

Flt. Lt. D. M. ROLPH-SMITH.—This officer has completed a large number of hours' operational flying, involving some long and arduous flights over mountainous areas, often in extremely adverse weather.

Act. Flt. Lt. J. S TAYLOR, R.A.F.V.R., No. 145 Sqn.—Flt. Lt. Taylor is a skilful and tenacious fighter. One day in January, 1943, he led his section in an attack on ten Macchi 200s, regardless of the fact that these were supported by another formation of enemy fighters. During the engagement two enemy aircraft were destroyed, one of them by Flt. Lt. Taylor. This officer has destroyed three and shared in the destruction of two more enemy aircraft.

Capt. C. L. FOULDS, S.A.A.F., No. 40 Sqn.—This officer has completed numerous reconnaissances over the Western Desert and Libya, displaying sound judgment and great skill throughout.

F/O. C. R. HESKETH, R.N.Z.A.F., No. 145 Sqn. —One day in January, 1943, this officer participated in an engagement against a force of enemy aircraft. During the fight his commanding officer's aircraft developed engine trouble. F/O. Hesketh, displaying great determination, covered the disabled aircraft until its pilot brought it safely down on to the sea. He then attacked the enemy force and shot down two aircraft within two minutes.

Lt. E. I. H. STURGEON, S.A.A.F., No. 40 Sqn. —This officer has completed numerous reconnaissances. On one occasion he piloted one of two aircraft which were intercepted by four Italian fighters. In the ensuing engagement two enemy

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aircraft were shot down, one of them by Lt. Sturgeon. On another occasion, in the El Alamein area, his aircraft was attacked by eight enemy aircraft, but he damaged one of them before his own aircraft was shot down. During the fight Lt. Sturgeon was wounded in the neck.

P/O. A. H. H. JENKINE, R.A.F.V.R.—This officer has taken part in very many operational missions. Throughout he has displayed exceptional navigational skill and achieved success in circumstances in which any lack of resource would have proved disastrous.

P/O. G. L. DOWNER, R.A.F.V.R., No. 101 Sqn.—P/O. Downer has participated in attacks on targets in Essen, Hamburg and Rostock. His initiative and personal example have been responsible for promoting a very fine team spirit among his crew. He has always displayed coolness and courage when faced with danger. This was particularly evident on one occasion last August, when it was necessary to bring his aircraft down on the sea and it sank within 30 seconds. The dinghy failed to operate, and P/O. Downer, with two other members of the crew, were in the sea for 80 minutes before being rescued. Throughout this trying experience he maintained a most cheerful confidence and shortly afterwards was on operational duty again.

P/O. S. G. DU-PLOOY, R.A.F.V.R., No. 59 Sqn.—Since joining this squadron, P/O. Du-Plooy has taken part in numerous anti-shipping patrols, always displaying exceptional keenness. He also participated in the "1,000 Bomber" raid on Bremen, spending 40 minutes over the target area to ensure accurate bombing, despite considerable opposition from anti-aircraft fire and night fighters. During July, 1942, he completed four attacks on enemy convoys off the Dutch coast sinking one large-sized vessel. On other occasions he has made long and perilous sorties, often in very poor weather.

P/O. R. S. EUSTACE, R.C.A.F., No. 207 Sqn.—P/O. Eustace has taken part in a large number of operational sorties, many of which have been against heavily defended targets. On his first sortie his aircraft was attacked by four enemy fighters. P/O. Eustace and the rear gunner used their guns so effectively that the attackers broke away. On another occasion this officer's aircraft was hit by anti-aircraft fire which damaged the intercommunication wiring, but he effected a skilful repair, thereby enabling his captain to fly on and successfully complete the sortie.

## 750 *Miles to Convoy*

P/O. A. W. FRASER, R.A.A.F., No. 120 Sqn.—This officer has taken part in numerous anti-submarine and convoy escort sorties, and has proved himself an exceptional pilot. On one occasion he found one of our convoys when 750 miles from his base, and by escorting it for 4½ hours undoubtedly saved it from submarine attack. On another occasion, while again engaged on escort duty, he sighted two U-boats, which he immediately attacked with depth charges and probably destroyed one of them.

P/O. A. V. FRY, R.A.F.V.R., No. 115 Sqn.—P/O. Fry has taken part in a large number of operational sorties against well-defended targets, including Essen, Bremen, Hamburg and Wilhelmshaven.

P/O. L. G. GOODLEY, R.A.F.V.R., No. 156 Sqn.—P/O. Goodley has participated in numerous operational sorties both in Europe and the Middle East. In a recent sortie against Lorient he obtained a valuable photograph and successfully illuminated the target with flares.

P/O. N. W. GREEN, R.A.F.V.R., No. 521 Sqn.—This officer has displayed exceptional proficiency both as navigator and meterological observer. On many occasions his alertness has been responsible for giving timely warning to his pilot of enemy attack. He is specially brilliant when accurate reporting of difficult meteorological conditions is necessary, and in this sphere has developed certain ingenious and valuable methods.

P/O. F. HILL, R.A.F.V.R., No. 101 Sqn.—P/O. Hill has always displayed a highly commendable keenness and determination to complete the task in hand. In August, 1942, when returning from Kassel, his aircraft was severely damaged and had to be abandoned when over the sea. The dinghy failed to operate, and P/O. Hill, with two other survivors, were in the water for some 80 minutes before being rescued. Despite this experience, his enthusiasm for operational flying has been maintained.

P/O. W. R. K. HUGHES, R.A.F.V.R., No. 12 Sqn.—This airman has at all times displayed exceptional courage, skill and initiative during operations from this country and in the Middle East. By virtue of his long and varied experience, he exercises a most valuable influence among the gunners of his squadron.

P/O. J. H. JANES, R.A.F.V.R., No. 35 Sqn.—This officer has completed a large number of operational sorties with great skill. Throughout he has set a splendid example to other members of his crew.

P/O. L. R. S. LUTON, R.A.F.V.R., No. 7 Sqn.—Throughout his operational career, this officer has completed his duties most conscientiously and efficiently. Whatever difficulty or opposition might be encountered, he has always endeavoured to secure accurate and precise bomb-aiming. Many successful photographs bear witness to the effectiveness of his work.

P/O. R. A. MARSHALL, R.A.F.V.R., No. 12 Sqn.—P/O. Marshall has always displayed great skill in locating his allotted target. His cheerful confidence while preparing for daring operations has inspired a high standard of morale in his crew.

P/O. A. MEAGHER, D.F.M., No. 61 Sqn.—P/O. Meagher has completed a number of operational sorties, including three attacks on Essen, and one on Berlin in January, 1943. He is particularly successful in reconnaissance duties and his reports of operations have proved extremely accurate.

P/O. L. F. NEWBERY, R.A.F.V.R., No. 218 Sqn.—Early in his operational career this airman displayed great coolness and resource in dealing with a fire which broke out after his aircraft had been badly damaged by anti-aircraft fire over Berlin. Later, while returning from an attack on Kiel, P/O. Newbery effectively drove off an enemy fighter which was last seen diving towards the earth. In January, 1943, a successful attack was made on a locomotive from a height of 60 feet.

P/O. B. C. SANDALL, R.A.F.V.R., No. 102 Sqn.—P/O. Sandall has taken part in attacks against some of the enemy's most heavily defended targets, including Emden, Bremen, Essen and Wilhelmshaven. On several occasions his aircraft has suffered damage from anti-aircraft fire and enemy fighters. On other occasions he has been detailed for Special Reconnaissance Flights. Throughout, his outstanding ability as a wireless operator has been of the utmost value to his captain and has largely contributed to the successes achieved.

## *U-Boat Straddled*

P/O. N. E. M. SMITH, R.A.F.V.R., No. 120 Sqn.—P/O. Smith has participated in offensive sweeps and anti-submarine patrols in all weather. On one occasion he attacked a U-boat successfully, straddling the vessel with six depth charges. On a later occasion two submarines were sighted in the vicinity of a convoy. P/O. Smith delivered a perfectly timed attack as a result of which the convoy was saved from serious consequences.

P/O. D. L. WILLIAMS, R.A.F.V.R., No. 207 Sqn.—This officer was detailed as Leading Navigator on the daylight operations against Danzig, when he displayed great skill and determination in navigating his aircraft successfully to the target in spite of very adverse weather. On other occasions he has flown as captain of aircraft, with inexperienced pilots, so that they might gain useful operational experience.

W/O. P. L. B. ELLIS, R.A.F.V.R., No. 120 Sqn. (since deceased).—This officer has displayed exceptional skill as a pilot on anti-submarine and convoy escort duties. On several occasions when so engaged he has rendered valuable services to our shipping. On one occasion he made a most successful attack on an enemy U-boat, pieces of which were blown into the air by his depth charges.

W/O. C. E. SORSDAHL, R.C.A.F., No. 35 Sqn.—During his many sorties against the enemy, W/O. Sorsdahl has always shown great determination and skill in reaching the target. His sound methods and careful preparation both before and during each sortie have contributed largely to the successes achieved.

Act. W/O. G. R. PHEBY, R.A.F.V.R., No. 83 Sqn.—W/O. Pheby has taken part in a large number of operational sorties, many of them against the more heavily defended German targets. Several times the aircraft in which he has been flying has suffered damage from anti-aircraft fire, and on three occasions has returned to base on three engines. By close co-operation with the navigator, W/O. Pheby has undoubtedly helped in the safe return of the aircraft. In July, 1942, he participated in a daylight attack on the submarine yards at Danzig, made in the most appalling weather. The navigation of the aircraft depended almost entirely on the skill of this officer, who thus in a large measure contributed to the safe journey to and from the target.

Act. Sqn. Ldr. D. A. PENNINGTON, No. 151 Sqn.—Sqn. Ldr. Pennington has served with an operational unit since September, 1939. On one occasion, he took part in a sortie when his squadron attacked an enemy airfield and destroyed 20 aircraft on the ground. In combat, this officer has destroyed three enemy aircraft.

Act. Sqn. Ldr. G. B. WARNES, R.A.F.V.R., No. 263 Sqn.

Act. Flt. Lt. H. J. BLACKSHAW, R.A.F.V.R., No. 263 Sqn.—Sqn. Ldr. Warnes and Flt. Lt. Blackshaw have participated in a great number of sorties, achieving many successes. On one occasion these pilots attacked and sank an armed trawler, while on another sortie they delivered a destructive attack on a distillery. In low-level raids on enemy airfields and other ground targets they have invariably pressed home their attacks with great determination. Sqn. Ldr. Warnes, who wears contact lenses to correct his sight for flying, and Flt. Lt. Blackshaw have displayed high qualities of leadership and outstanding keenness.

F/O. A. D. WAGNER, R.A.F.V.R., No. 151 Sqn.—In all his combats this officer has displayed great determination and resource. During a patrol over this country one night in 1941 he sighted a He 111, but, whilst making his attack, his turret became jammed with his guns in the beam position. Despite this, he closed in on the enemy aircraft and, by skilfully manœuvring his aircraft, he fired his guns from their rigid position and shot the enemy aircraft down. F/O. Wagner continued his patrol and sighted another enemy aircraft, which he attacked and damaged by similar tactics. This officer has rendered valuable service in the Middle East, and, while in Ceylon, he destroyed two Japanese bombers.

## *Daylight Sorties*

Wing Cdr. W. P. SHAND, No. 139 Sqn.—In February, 1943, Wing Cdr. Shand and Flt. Sgt. Handley were pilot and navigator respectively of the leading aircraft of a section of bombers detailed to attack the locomotive sheds at Tours in daylight. On the outward journey, which involved a flight of more than 100 miles over strongly defended enemy territory, adverse weather was encountered along almost the whole route. Despite this, brilliant navigation by Flt. Sgt. Handley enabled his pilot to reach the target exactly as planned. Making a skilful approach, Wing Cdr. Shand led his section in to the attack and the target was accurately bombed from a low level. They have previously flown together on several daring daylight sorties.

Sqn. Ldr. C. L. OLSSON, R.A.F.O., No. 142 Sqn., awarded with effect from July 20th, 1942.—This officer has participated in attacks on a wide range of enemy targets, including highly defended places such as Bremen, Hamburg and Cologne. He has always pressed home his attacks in the most determined manner whatever the opposition.

Act. Sqn. Ldr. W. A. ANDERSON, R.C.A.F., No. 407 (R.C.A.F.) Sqn. (deceased), awarded with effect from December 15th, 1941.—This officer has always shown the greatest keenness and enthusiasm for operational flying. On one occasion he carried out a successful low-level attack on a well-defended convoy off Ameland, obtaining a hit on the largest vessel of some 10,000 tons. On other occasions he has attacked convoys at night, always at a low level and in the face of intense anti-aircraft fire, obtaining a hit on a 2,500-ton

**THE SIGN OF THE WHITE ROSE: Pilots of a famous squadron now flying Typhoons. Those familiar with the Wars of the Roses will guess which squadron it is.**

vessel from 50 feet. He also attacked the vessel with machine-gun fire. On another sortie, Sqn. Ldr. Anderson was detailed to illuminate with flares the position of a convoy to direct a bombing force to the attack. He skilfully accomplished his mission in the face of fire from the ships.

Major J. L. HEWITSA, S.A.A.F., No. 5 (S.A.A.F.) Sqn., awarded with effect from June 2nd, 1942.—This officer has participated in nearly every one of the squadron's recent sorties. By his valuable and excellent leadership in his particular task, the squadron has been able to return with valuable information concerning the enemy, and, at the same time, inflict heavy casualties on the enemy in the air. Major Hewitsa has destroyed at least three enemy aircraft.

Flt. Lt. J. F. DAVIS, R.A.F.V.R., No. 95 Sqn.—This officer has been continuously employed on operational flying since January, 1941, and has served as captain of aircraft since May, 1942. On one occasion the oil pressure on one engine of his aircraft dropped and he was forced to turn back. The propeller became loose and eventually flew off, but owing to this officer's resourcefulness and superb airmanship the aircraft suffered no further damage and he was able to land it successfully.

Flt. Lt. J. L. NUNN, R.A.F.V.R., No. 97 Sqn., awarded with effect from September 9th, 1942.—Flt. Lt. Nunn was serving as captain of an aircraft returning from night operations and still over enemy territory when his aircraft was attacked by an enemy fighter. After two attacks the engine caught fire and Flt. Lt. Nunn gave orders for the crew to prepare to abandon the aircraft, but he then found the rear gunner was severely wounded and was unable to leave. Flt. Lt. Nunn therefore continued to pilot the aircraft and eventually crash landed, as a result of which he received severe injuries.

### *Two Stukas*

Flt. Lt. J. E. A. WILLIAMS, No. 450 Sqn., awarded with effect from September 23rd, 1942.—In September, 1942, Flt. Lt. Williams led his squadron in an attack on a formation of Stukas, strongly escorted by fighters. Displaying great determination he personally destroyed two Stukas. Again, when participating in a defensive patrol over Trigh Capuzzo, his formation was attacked by hostile fighter aircraft. He singled one out and pursued it almost to Tobruk, where he destroyed it. He has since destroyed a fourth enemy aircraft.

Act. Flt. Lt. E. D. BAKER, R.C.A.F., No. 214 Sqn. (deceased), awarded with effect from March 30th, 1942—This officer has completed numerous sorties since September, 1941, involving attacks on Berlin, Stettin, Kiel, Brest, Hamburg and Lubeck. One night in February, 1942, whilst attacking Kiel, his aircraft was extensively damaged by anti-aircraft fire, the undercarriage, flaps and turrets being rendered useless. The airspeed indicator ceased to function and the fabric was torn in numerous places. On the return journey, height was lost continually owing to engine trouble. Despite this, Flt. Lt. Baker skilfully flew his damaged aircraft to an airfield in this country where he landed with the undercarriage retracted. On impact, the aircraft caught fire. The crew managed to escape but the second pilot and a gunner each sustained a fractured arm, while Flt. Lt. Baker's nose was broken.

Act. Flt. Lt. A. G. BIRD, R.A.F.V.R., No. 268 Sqn.—Flt. Lt. Bird has taken part in many and varied operational sorties, including the "1,000 bomber raid" in May, 1942. On several occasions his aircraft has been hit by anti-aircraft fire, but Flt. Lt. Bird has always displayed skill and flown back to base safely. In February, 1943, he led a highly successful attack over Holland and later in the same month he led a formation of seven aircraft in an attack on a barracks in Holland, returning without loss or damage to any aircraft.

Act. Flt. Lt. T. H. E. GOLDIE, R.A.F.V.R., No. 200 Sqn.—Flt. Lt. Goldie has completed a large number of operational flying hours. In October, 1942 while on a patrol he sighted a lifeboat containing survivors and continued to patrol in the vicinity of the boat to the limit of daylight, in extremely bad weather. Later in the same month he made four sorties in ten days in the face of heavy and accurate anti-aircraft fire. He also made a flight of 500 miles over hostile territory in November, 1942, in addition to a number of reconnaissance sorties.

### *Through Ostend Streets*

Act. Flt. Lt. M. J. GRAY, R.A.F.V.R., No. 168 Sqn.—This officer is a fine leader and a courageous pilot, who has completed many long-range reconnaissances in single-seater fighters. During sorties in search of enemy shipping along the Dutch coast he has located and reported accurately the position of numerous convoys. Flt. Lt. Gray has damaged eight enemy vessels and nine locomotives. No aircraft has been lost from any formation led by him. On a recent sortie he flew low through the streets of Ostend in the face of intense anti-aircraft fire.

Act. Flt. Lt. C. G. MARSHALL, R.A.F.V.R., No. 95 Sqn.—Since May, 1942, Flt. Lt. Marshall has flown on many operational sorties. On one occasion while serving as second pilot his aircraft was forced to alight on the sea and was towed to port. He went aboard the corvette and organised the tow, giving valuable assistance both to his captain and the captain of the corvette. Later as captain of aircraft, by his skilful airmanship, he has several times successfully fought off enemy aircraft. On one sortie his aircraft was severely damaged but he flew it safely back, a distance of 150 miles, on two engines. On yet another occasion this officer's aircraft was attacked by a Fw. Kurrier, but with skill and courage he successfully drove off the attacker.

F/O. H. L. COONS, R.C.A.F., No. 95 Sqn.—This officer has been continuously engaged in operational duties since September, 1941. On two occasions his aircraft has been forced down on to the sea. Its exact location, however, was easily discovered by the searching ships as a result of the accurate signals sent out by F/O. Coons. When, on another sortie, the bomb room caught fire, this officer gallantly assisted in extinguishing the outbreak. Three times he has participated in engagements with enemy aircraft and, on the last occasion, a Fw. Kurrier was probably destroyed.

F/O. R. J. COOPER, No. 38 Sqn. (deceased), awarded with effect from October 28th, 1941.—Since October, 1940, this officer has carried out many operational sorties. One night in September, 1941, during a raid on Tripoli, his aircraft was hit by anti-aircraft fire which ignited one of the parachute flares in his aircraft. The aircraft caught fire but, under F/O. Cooper's direction, the flames were extinguished and the aircraft was flown safely back to base.

F/O. B. J. FYSON, R.A.F.V.R., No. 103 Sqn. (deceased), awarded with effect from March 21st, 1942.—This officer has displayed outstanding ability as an air-gunner and his quiet confidence has contributed largely in maintaining the morale of his crew at a very high standard. In July, 1941, he took part in a daylight raid against the enemy battleships at Brest, and, whilst crossing the French coast, his section was attacked by three enemy fighters, all of which were shot down after a fierce engagement at very short range. Throughout this encounter F/O. Fyson, as rear gunner in the leading aircraft, displayed great coolness, and handled his guns with determination. He undoubtedly assisted in shooting down two of the three aircraft and was solely responsible for destroying the third at a range of less than 50 yards.

**NEW HATS FOR THE LADIES: The old (left) and new style of head gear for the Canadian W.A.A.F. Opinion is almost bound to differ.**

## SERVICE

F/O. L. A. J. MILLS, R.A.F.V.R. (deceased), awarded with effect from August 26th, 1941.—This officer has completed numerous long-range sorties as rear gunner. One of these was a daylight attack on Borkum, in the course of which his aircraft was attacked by four Me. 109s. Although wounded in the left forearm by fire from the first enemy aircraft, F/O. Mills repelled the attack but, as he was being relieved, a further attack was made by the enemy fighters. Despite great pain from six shrapnel wounds in the forearm, which must have affected his ability to manipulate his turret, F/O. Mills immediately returned to his post and displaying unshakeable confidence, engaged and destroyed one of the attackers. Since recovering from his wounds F/O. Mills has participated in the attack on the enemy battle cruiser at La Pallice. His aircraft was intercepted by three Messerschmitts, but he successfully drove them off, damaging one by accurate fire at long range.

Act. F/O. N. E. WINCH, R.A.F.V.R., No. 7 Sqn., awarded with effect from May 14th, 1942.—This officer is a skilful and keen captain of aircraft. Since September 1941, he has participated in a large number of sorties, including Berlin, Brest, Essen, Kiel, Rostock and Warnemund. In April, 1942, he was captain of an aircraft detailed to attack a target in the Ruhr. Following a successful attack, his aircraft was attacked by an enemy fighter, which was shot down and seen to crash.

P/O. J. A. WORSWICK, R.A.F.V.R., No. 106 Sqn. (deceased), awarded with effect from May 24th, 1942.—P/O. Worswick's first operational sorties were made as navigator of Hampden aircraft. In July, 1941, he participated in the daylight raid on Brest. A few weeks later he took part in a daylight attack on the power station at Gosnay. Other sorties include mine laying missions in the Baltic and the bombing of the enemy's naval ports and of industrial targets in the Ruhr. Recently P/O. Worwick has acted as captain of aircraft. He has participated in raids on Essen, Lubeck and a low-level attack on Rostock.

Flt. Lt. M. H. MAGGS, R.A.F.V.R., No. 605 Sqn.—This officer, who has completed a large number of operational missions, is a skilful and determined air gunner. He has destroyed two enemy aircraft at night.

F/O. A. J. HEMELIK, R.A.F.V.R., No. 70 Sqn.—F/O. Hemelik is a navigator-bomb aimer of high merit. Whatever the opposition he never releases his bombs until he is satisfied that the objectives are truly in his sights. Several times he has made a number of runs over the target to ensure accuracy of aim. On three occasions, when ordered to release flares to illuminate the bombing by other craft of Tobruk, then most heavily defended, he accomplished his task in what was judged the best of many such operations. In the battle area F/O. Hemelik has taken part in many sorties.

F/O. W. M. WHITAMORE, R.A.F.V.R., No. 601 Sqn.—This officer is a keen and determined fighter who has destroyed four and damaged several more enemy aircraft. His fine leadership and excellent example have been worthy of high praise.

P/O. R. F. SCOTT-KIDDIE, No. 162 Sqn.—P/O. Scott-Kiddie, who is an air gunner, has displayed great courage and coolness in the face of the enemy. On four occasions, when his aircraft has been attacked by enemy fighters, his concise commentary on the enemy's movements have enabled his pilot to take the necessary evading action. On three of these encounters his good shooting has damaged the attacking aircraft.

## Distinguished Flying Medal

Flt. Sgt. C. STEWART, No. 7 Sqn.—For citation see Flt. Lt. Thompson, D.F.C.

Flt. Sgt. C. D. HANDLEY, No. 139 Sqn.—For citation see Wing Cdr Shand.

Sgt. K. P. LEACH, No. 235 Sqn.—As navigator, Sgt. Leach has flown on many operational missions. On several occasions, when his aircraft has sustained damage in encounters with the enemy, his skilful work has contributed materially to its safe return to base. In February, 1943, during a reconnaissance flight, his aircraft was attacked by two enemy fighters. During the engagement Sgt. Leach was wounded in the foot, but, while rendering assistance to his pilot, who had been hit in the shoulder, he gave skilful evading directions which enabled the pilot to shake off the attackers.

Flt. Sgt. G. A. WEST, No. 97 Sqn.—This airman has completed numerous operational sorties over very heavily defended targets both in Germany and Italy. On one occasion in December, his aircraft was attacked by an enemy fighter and had to be flown back to this country in very adverse circumstances. His cool and skilful action undoubtedly saved the lives of the injured members of his crew.

Act. Flt. Sgt. F. GILES, No. 156 Sqn.—Flt. Sgt. Giles has participated in a large number of operational sorties, on many of which his skill and determination have been largely instrumental in locating and bombing the target despite adverse weather. One night in October, 1942, in operations against objectives in Western Germany, this airman successfully navigated his aircraft to the target in spite of heavy cloud conditions and dropped his flares.

Flt. Sgt. J. MCFARLANE, R.A.A.F., No. 450 (R.A.A.F.) Sqn.—In operations in the Western Desert this pilot has displayed great keenness and determination. He has participated in many sorties, involving low bombing and machine gun attacks and fighter escorts. In addition to

destroying one enemy aircraft in combat. Flt. Sgt. McFarlane has inflicted considerable damage to enemy targets on the ground.

Flt. Sgt. C. S. MARSH.—As air gunner, Flt. Sgt. Marsh has completed a large number of operational missions. Throughout he has displayed great determination and devotion to duty and has proved himself to be a valuable member of aircraft crew.

### *Jettison Over Alps*

Flt. Sgt. M. E. WHITE, R.C.A.F., No. 156 Sqn. —One night in February, 1943, Flt. Sgt. White was the pilot of an aircraft detailed to attack Turin. Whilst over the target area the aircraft was hit by anti-aircraft fire. A large splinter damaged the main plane and the port inner tank, causing one engine to fail. On the return journey, when crossing the Alps, all movable equipment was jettisoned in an effort to maintain height. Much petrol was lost, but, displaying superb airmanship and great tenacity, Flt. Sgt. White flew the damaged aircraft back to this country with one engine out of action.

Sgt. W. MCLEAN No. 7 Sqn.—One night in December, 1942, Sgt. McLean was the rear gunner of an aircraft detailed to attack a target in the Rhineland. During the operation the aircraft was hit by anti-aircraft fire, which rendered the rear turret unservicable. Unperturbed, Sgt. McLean operated the turret manually, and, when the aircraft was attacked by an enemy fighter, his courageous conduct was worthy of high praise.

Sgt. N. F. MOSES, R.A.A.F., No. 178 Sqn.—Sgt. Moses was the rear gunner of an aircraft when in January, 1943, was detailed to attack Tripoli by night. When nearing the target the aircraft was subjected to anti-aircraft fire. A shell burst in the rear compartment, slightly wounding Sgt. Moses and causing small arms ammunition to explode. Pyrotechnics were in danger of becoming ignited, but Sgt. Moses, displaying great coolness and initiative, succeeded in jettisoning them.

Act. Flt. Sgt. R. C. MANNS, No. 7 Sqn.—This airman has operated against many of the more heavily defended targets in Germany, and owing to his technical skill his aircraft has been notably free from wireless troubles throughout.

Act. Flt. Sgt. R. G. POINTER, No. 7 Sqn.—This airman has completed a large number of operational sorties, many of them against very heavily defended targets. His keenness and efficiency are deserving of the highest praise.

Act. Flt. Sgt. J. H. ROSS, No. 7 Sqn.—On all his sorties this airman has performed his duties in an exemplary manner On many long and difficult flights his efficiency has been of great assistance to his navigator and pilot.

Act. Flt. Sgt. G. C. STAFFORD, No. 156 Sqn.—In August, 1942, the aircraft in which this airman was flying as rear gunner was attacked by a Ju 88 near Antwerp. His turret was rendered unservicable by cannon fire, but Flt. Sgt. Stafford by cool and skilful direction enabled his pilot to evade the fighter and return safely to base.

Act. Flt. Sgt. D. E. UDY, No. 7 Sqn.—During all his operational sorties Flt. Sgt. Udy has shown the greatest reliability and efficiency. His outstanding enthusiasm to participate in operational flying has set a fine example.

Act. Flt. Sgt. A. E. WADDICORE, No. 35 Sqn.—Flt. Sgt. Waddicore has always shown an exceptional keenness to operate against the enemy. During attacks against heavily defended targets he has consistently displayed great skill in maintaining the efficient running of his engines.

Act. Flt. Sgt. F. T. B. WILLS, No. 7 Sqn.—During his operational career this airman has displayed a constant desire to engage the enemy whenever possible. He has always been a most reliable member of air crew, and despite several very harassing experiences his keenness and enthusiasm are undaunted.

Sgt. J. E. G. ASTON, No. 103 Sqn.—Since July, 1942, this airman has completed many operational flights, in the course of which he has proved himself to be a most efficient and conscientious Flight Engineer. On one occasion, when on a mission to Bremen, his aircraft was badly damaged by fire from a night fighter. The port petrol tanks were holed and both port engines failed. Sgt. Aston, by skilful manipulation of the petrol supply system, enabled the aircraft to fly on to the target, which was attacked successfully. On the return journey further trouble was experienced with the engines, which was again overcome by this airman's technical skill, and he kept the engines running until base was reached.

Sgt. J. BENBOW, No. 97 Sqn.—Sgt. Benbow has participated in attacks against targets in the most heavily defended areas of Western Germany, Genoa and Turin. He also took part in the daylight operations at Le Creusot and Milan.

Sgt. I. A. BLAIKIE, R.N.Z.A.F., No. 104 Sqn.—During the last six months Sgt. Blaikie has flown on operations with coolness and courage. It is largely due to his skilful navigation and bomb aiming that many successes have been achieved.

Sgt. J. BURNS, No. 172 Sqn.—The outstanding ability and efficiency of Sgt. Burns have enabled his captain to locate and probably destroy two U-boats. Throughout many operational sorties this airman has performed arduous and monotonous duties with keenness and reliability.

Sgt. J. H. CRISP, No. 97 Sqn.—Throughout his operational career Sgt. Crisp has displayed courage and skill of a high order. He has completed numerous operational sorties, many of them over heavily defended targets in Western Germany and raids on Brest and Augsburg in daylight.

Sgt. D. C. DAVIES, No. 51 Sqn.—Throughout his operations with this Squadron Sgt. Davies has flown with many outstanding captains. He has always displayed cheerful determination and courage, and has attained consistently good results in bombing.

Sgt. K. C. DIXON, No. 40 Sqn.—Sgt. Dixon has carried out a number of operational sorties, including attacks against airfields in Tunis, Bizerta and Sicily. Throughout he has performed his duties with great efficiency.

Sgt. S. R. EDWARDS, No. 207 Sqn.—Sgt. Edwards has completed a large number of operational sorties, and has shown considerable ability both as navigator and bomb aimer. He has obtained many excellent photographs.

Sgt. E. EVANS, No. 106 Sqn.—Sgt. Evans has been engaged on flying operations for a number of months, and has taken part in sorties over widely separated targets in enemy territory. These include daylight raids on Danzig, Milan and Le Creusot.

Sgt. O. A. FOX, No. 1651 Conversion Unit.—This N.C.O. has participated in many operational sorties, including attacks against Cologne, Hamburg, Essen, Bremen and other heavily defended targets.

Sgt. W. HERBERT, No. 106 Sqn.—Sgt. Herbert has made many operational attacks on the enemy's important industrial centres. He has bombed targets at Turin and Genoa. At the latter place he obtained an excellent photograph. Sgt. Herbert also participated in the daylight raid on Milan.

### *Lights and Shipping*

Sgt. E. K. HOLMES, No. 102 Sqn.—Since April, 1942, Sgt. Holmes has completed a large number of operational missions, the majority against such heavily defended targets as Bremen, Essen, Emden and Hamburg. On three occasions his aircraft has been damaged by anti-aircraft fire, and twice has returned to base on three engines. During the "1,000" bomber raid on Bremen, Sgt. Holmes manned the beam guns to attack shipping and searchlights from a low level.

Sgt. G. HORSBURGH, No. 40 Sqn.—Throughout his many operational sorties, Sgt. Horsburgh has performed his duties in a cool and efficient manner, setting a fine example by his meticulous attention to detail when preparing for operations.

Sgt. R. J. LEET, R.C.A.F., No. 103 Sqn.—Sgt. Leet has displayed the greatest determination and devotion to his duties. On one occasion, when crossing the Alps to attack Turin, he replaced the tail gunner, whose oxygen apparatus had failed, keeping himself alert by the ingenuous use of portable oxygen gear, he was largely responsible for the success of the mission.

Sgt. W. H. MERRICK, No. 69 Sqn.—Sgt. Merrick has been largely responsible for many successes by his pilot. In August, 1942, he attacked an enemy cruiser which was attempting to attack a convoy. The cruiser was forced to return for repairs. On another occasion, despite violent alterations of course to avoid enemy night fighters, he navigated his aircraft to its target, which was bombed successfully.

Sgt. H. MOORE, No. 101 Sqn.—This airman has displayed a high degree of courage and initiative throughout his operational career. He has proved himself to be a very efficient bomb aimer, who by hard work and keenness has contributed much to the success of many sorties. These have included a very daring daylight raid on a target in North West Germany, in the course of which Sgt. Moore exhibited great coolness and skill.

**IN HIS OFFICE: Air Vice-Marshal H. V. Champion de Crespigny, C.B., M.C., D.F.C., Air Officer Commanding Air Headquarters Iraq and Persia. Iraq and Persia come under Middle East Command.**

### *Gave Up Oxygen Mask*

Sgt. R. M. MOULD, R.A.A.F., No. 460 (R.A.A.F.) Sqn.—One night in December, 1942, while on a sortie against Turin, the rear gunner of an aircraft in which Sgt. Mould was flying found that his oxygen mask had become unserviceable. Sgt. Mould immediately gave his own mask to the rear gunner, ingeniously improvising an oxygen supply for himself. Whilst on the return journey the intercommunication gear failed, and had to be repaired by Sgt. Mould, who completed this difficult task at an altitude of over 14,000 feet, while still encumbered by his improvised oxygen tube.

Sgt. R. S. MACF. NIELSON, No. 460 (R.A.A.F.) Sqn.—Throughout his operational career Sgt. Nielson has shown outstanding ability and a strong sense of duty, combined with a very fine record of achievement as a navigator. One night in January, 1943, while on the return journey from the Ruhr, the bomber in which Sgt. Nielson was flying was attacked by enemy aircraft and damaged. During violent evasive action the aircraft was driven well off the correct course, but largely owing to the skill of this airman base was reached safely.

Sgt. J. W. D. ROBIN, R.A.A.F., No. 106 Sqn.—Sgt. Robin is an air gunner of outstanding ability. He has participated in raids on a wide variety of targets, including Berlin. In daylight he took part in the raid on Le Creusot.

Sgt. A. SHACKLETON, No. 207 Sqn.—Sgt. Shackleton has a fine fighting spirit, and has always shown great keenness to engage the enemy. On one occasion, when returning from Hamburg, he descended to 50 feet and attacked a coastal battery and successfully shot out a number of searchlights. On another occasion an anti-aircraft shell hit the aircraft in which he was flying, setting fire to some ammunition. Despite the danger from exploding bullets Sgt. Shackleton and another member of the crew successfully extinguished the fire, thereby enabling the aircraft to return to base safely.

Sgt. N. W. SIMISTER, No. 207 Sqn.—This airman has displayed exceptional keenness and devotion to duty. He is a very capable air gunner, and by his alertness and skill has on several occasions prevented surprise attacks by night fighters. Undaunted by difficulties or dangers, Sgt. Simister has always displayed great coolness and courage.

Sgt. R. J. TAAFFE, R.N.Z.A.F., No. 104 Sqn.—Throughout Sgt. Taaffe has consistently displayed high courage and determination, which has set a magnificent example to other air crews. At all times this airman has pressed home his attacks with the utmost courage and determination, and has obtained many brilliant hits with his bombs.

Sgt. (now P/O.) E. WHARTON, No. 97 Sqn.—This airman has completed numerous operational sorties against heavily defended targets in Western Germany and Italy. He has also participated in successful raids on Danzig and Le Creusot in daylight.

Flt. Sgt. J. D. M. HERRON, R.N.Z.A.F., No. 207 Sqn., awarded with effect from October 31st, 1942.

# SERVICE AVIATION

—Flt. Sgt. Herron as captain of aircraft, has always shown outstanding courage and determination on operations. He has displayed an extremely high sense of duty, and his tireless efforts to maintain that very high standard during a most exacting time have been an inspiration to the rest of his squadron.

Flt. Sgt. W. J. McLEAN, No. 103 Sqn., awarded with effect from September 2nd, 1942.—This wireless operator has taken part in numerous operational sorties. On one occasion when detailed to bomb Stuttgart his aircraft was severely damaged, but his skill and accuracy assisted greatly in the safe return of the aircraft. On another occasion, when returning from Cologne, they were attacked by an enemy night fighter. The second pilot was killed, the rear gunner wounded, and the fuselage set on fire. Displaying great presence of mind and with complete disregard for his own safety, Flt. Sgt. McLean put out the fire, rendered first-aid to the rear gunner, and finally effected a difficult repair, making the wireless serviceable. On yet another occasion, and with the same crew, the hydraulic tank burst and sprayed all over his eyes. Despite great physical suffering, this N.C.O. carried on at his wireless set, taking a full share in bringing the aircraft safely back to base.

Sgt. J. H. STEWART, No. 95 Sqn.—Sgt. Stewart has displayed outstanding skill and tenacity in the course of many operational sorties. On one occasion this airman spent eight hours in the wing of his aircraft tending to an engine which was faulty. On another flight, after a combat with three hostile fighters, it was due to Sgt. Stewart's fine technical skill that his damaged aircraft was able to fly for 150 miles and land safely.

Sgt. W. A. FRASER, R.N.Z.A.F., No. 221 Sqn.—This airman, who has flown on numerous sorties, is the pilot of a torpedo-carrying aircraft. One night in February, 1943, he attacked a tanker of medium size off the Italian coast, releasing his torpedoes from a position almost head on. Sgt. Fraser so skilfully executed his attack that not only was the vessel set on fire, but neither of its escorting destroyers succeeded in firing a single shot before he flew clear. Some nights later he was detailed to attack another tanker. This time considerable anti-aircraft fire was encountered from the vessel's two escorting destroyers. His aircraft was damaged and the rear gunner wounded. In spite of this, Sgt. Fraser released a torpedo which hit the tanker amidships.

## Roll of Honour

*Casualty Communiqué No.* 223.

THE Air Ministry regrets to announce the following casualties on various dates. The next of kin have been informed. Casualties "in action" are due to flying operations against the enemy; "on active service" includes ground casualties due to enemy action, non-operational flying casualties, fatal accidents and natural deaths.

Of the names in this list 39 are second entries giving later information of casualties published in earlier lists.

### Royal Air Force

KILLED IN ACTION.—Sgt. W. A. Champion; Sgt. G. D. Cumberbatch; Flt. Sgt. A. H. Evans, D.F.M.; Sgt. J. E. Ford; Sgt. A. W. Gillespie; Sgt. B. T. Hallett; Sgt. J. McD. McKinnie; Sgt. F. C. E. Miller; Act. Flt. Lt. G. North; Sgt. H. W. Ricketts; Sgt. R. H. P. Roberts; Sgt. J. Robinson; Sgt. A. H. Spence; Sgt. V. P. Thompson; Sgt. H. H. Turkentine; Sgt. R. E. J. White.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—Flt. Sgt. S. W. Allen; Act. Flt. Lt. H. A. C. Batten; Flt. Sgt. J. R. Connor; Sgt. E. Hepworth; P/O. D. M. Johnson; Flt. Sgt. J. McK. McLean; W/O. L. Rosekilly; P/O. R. E. Thornley; P/O. R. A. G. Tucker.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Sgt. A. W. Daniel; Flt. Sgt. S. B. T. Davis; Sgt. E. C. Gregory; Flt. Sgt. K. J. O. Hawkins; Wing Cdr. C. F. Herington; Sgt. J. Law; Sgt. D. D. Northfield; Sgt. W. T. Smith; Sgt. G. S. Standring; Sgt. R. H. Stanghan; Flt. Sgt. C. H. Vickers; Sgt. S. B. Ward.

WOUNDED OR INJURED IN ACTION.—Sgt. F. J. Brown; Sgt. G. V. Delaroy-Hall; Sgt. J. M. Fryer; Sgt. D. Livingston; Sgt. J. T. Page.

MISSING, BELIEVED KILLED IN ACTION.—F/O. P. L. Beesley; Sgt. H. G. Bone; Sgt. E. Brindle; Sgt. A. B. Burgess; Sgt. L. Bygrave; Sgt. P. G. Carr; Sgt. M. F. Clements; Sgt. E. F. Cowper; Sgt. K. W. Edwards; Sgt. S. J. Gray; Sgt. H. Kay; Sgt. R. Lewis, D.F.M.; Flt. Sgt. M. W. Lofthouse; Sgt. C. A. Pitt; Sgt. T. G. Rait; F/O. D. J. Rose; Flt. Sgt. D. Skinner; Sgt. D. J. Smith; Sgt. T. W. Strong; Sgt. G. W. Whiles.

MISSING.—Sgt. E. A. Arnold; Sgt. R. J. Barkham; Sgt. K. Bowley; F/O. P. Brennan; Act. Flt. Lt. J. A. Bright; F/O. S. J. Cornes; Sgt. E. F. Crowhurst; Sgt. D. G. Davies; Sgt. W. R. Erasmus; Sgt. J. G. Ethelston; Sgt. F. J. Evans; Flt. Sgt. T. I. Evans; Sgt. S. H. K. Eyre; Sgt. J. A. Fyfe; Sgt. S. G. Fisher; Flt. Sgt. E. Froggart; Sgt. M. Goldrick; Sgt. C. N. Goodchild; Sgt. D. P. Hamilton; F/O. J. S. Holmes, D.F.C.; Sgt. A. Howells; Sgt. A. Hunt; Sgt. J. Hunter; P/O. W. F. G. Hutchings; Sgt. H. M. Kennard; Act. Flt. Sgt. L. Knill; P/O. A. C. R. Laundon; Sgt. A. D. Lockyer; Flt. Sgt. J. McAllister; Flt. Sgt. D. V. Marchand; Act. Flt. Sgt. R. L. Merrett; P/O. J. S. Milne; Sgt. G. Morrall; P/O. R. Nash; Sgt. E. W. Oxenbridge; Sgt. L. J. Preece; Sgt. S. P. H. Purchase; Sgt. C. E. Read; Sgt. J. L. Richardson; Act. Sqn. Ldr. A. E. Robinson; Sgt. D. B. Sayer; Flt. Sgt. A. E. Schildknecht; P/O. A. B. Scholey; F/O. L. A. Smith, D.F.C.; Sgt. F. Spencer; Sgt. F. I. Tillen; Sgt. F. T. Tolhurst; Flt. Lt. D. Toone; Sgt. G. T. Vincent; F/O. G. F. J. Waite; Sgt. R. Walton; Sgt. K. White; Sgt. W. A. Wilkinson; Sgt. B. W. Willbourn; Sgt. S. A. G. Wraight.

KILLED ON ACTIVE SERVICE.—Sgt. A. J. Adams; Sgt. D. W. Alexander; Sgt. D. L. Barley; Sgt. D. R. Bending; Sgt. H. G. Brookes; Sgt. L. A. Brown; L.A/C. V. H. Cockman; Sgt. C. Davidson; P/O. J. Donnelly; Sgt. J. Evans; Sgt. J. Fielding; L.A/C. F. R. W. Frostick; Sgt. G. J. Gates; Sgt. W. S. Gibson; Sgt. T. D. Griffith; Sgt. H. F. Gullery; Sgt. A. M. Harris; Sgt. E. J. Henry; L.A/C. M. J. M. Hosier; Sgt. W. J. Hubbard; Sgt. L. V. Jackson; L.A/C. M. L. Jensen; L.A/C. G. M. Johnston; L.A/C. A. J. Kelly; Sgt. F. J. Keown; Sgt. C. R. Land; Act. F/O. P. W. Lomax; Sgt. F. V. McGonigal; Sgt. I. D. MacDonald; Sgt. G. Marshall; Sgt. S. W. Marshall; Sgt. R. V. N. Moss; Flt. Sgt. H. Murray; Sgt. O. O. Openshaw; Sgt. R. J. Packer; Sgt. A. Page; Sgt. S. F. Peachey; L.A/C. D. A. Pettigrew; Sgt. G. T. Pierce; Sgt. A. W. Reid; Cpl. C. W. Revell; P/O. S. C. Rogers; Sgt. C. H. E. Ross; L.A/C. H. J. Sapsed; Sgt. H. Sharp; Flt. Sgt. H. Smith; L.A/C. J. R. Smith; Sgt. R. W. Smith; Sgt. B. C. Staunton; Sgt. J. Sykes; Sgt. T. J. Thompson; Sgt. D. K. Upperton; Sgt. F. Wickenden; F/O. D. P. R. Wild; Sgt. A. H. Williams; Sgt. J. M. Wilson; P/O. T. Winstanley; Sgt. A. Witton.

WOUNDED OR INJURED ON ACTIVE SERVICE.—Sgt. T. Donald; Sgt. A. G. MacDonald; Sgt. B. S. Smith.

DIED OF WOUNDS OR INJURIES RECEIVED ON ACTIVE SERVICE.—Cpl. W. E. Broxham; Sgt. P. G. Cust; L.A/C. G. L. James.

DIED ON ACTIVE SERVICE.—Cpl. A. A. Baldock; L.A/C. G. A. Bedford; Sgt. S. J. Dean; A/C.1 R. P. Gray; L.A/C. R. W. A Grigg; L.A/C. V. W. Guest; Cpl. G. W. Hall; Cpl. W. J. Hobbs; L.A/C. F. C. Kemsley; Cpl. C. MacKenzie; A/C.1 W. A. Muirhead; Cpl. J. C. Triscott; Flt. Sgt. R. Trotman; A/C.2 R. P. Tytler.

### Women's Auxiliary Air Force

DIED ON ACTIVE SERVICE.—A/CW.2 E. L. Thain.

### Royal Australian Air Force

MISSING.—F/O. H. Braine; Sgt. E. J. Ding; Sgt. A. Knight; Flt. Sgt. J. K. Ridley; Sgt. H. T. Waddell.

**A very posed photograph of W.A.A.F. personnel stocking a Catalina with smoke floats. It is, however, the first photograph to show .5in. guns fitted in the blisters of an R.A.F. Catalina.**

KILLED ON ACTIVE SERVICE.—Sgt. F. G. Bell; Sgt. R. K. Hodson; Sgt. K. V. Howes.

### Royal Canadian Air Force

KILLED IN ACTION.—Sgt. G. R. Avey; Sgt. P. B. Campbell; F/O. J. F. Greenan; Sgt. R. R. Landry; F/O. K. R. Maffre; Sgt. J. B. Mallett; Flt. Sgt. F. W. Music; Sgt. Z. M. Niblock; Flt. Sgt. R. E. Vokey.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—Sgt. W. J. Hesp; Sgt. J. S. Orr; Flt. Sgt. L. J. W. Rosa; P/O. R. A. Shires; Sgt. J. F. Tuck.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Sgt. H. D. Baittle; Sgt. A. B. Harper; Flt. Sgt. L. D. Hiltz; Sgt. D. A. McKay; P/O. A. R. Montgomery; W/O. A. C. Vautour.

MISSING, BELIEVED KILLED IN ACTION.—P/O. W. M. Currie.

MISSING.—Sgt. H. R. Bailey; Sgt. L. J. Conway; Sgt. C. O. Cook; Sgt. J. O. R. Gauthier; Flt. Sgt. J. J. Gendron; Flt. Sgt. R. W. Ferrier; F/O. C. A. McKinnon; P/O. J. C. Monteith; Flt. Sgt. D. O'Neill; Sgt. R. C. Ramsay; Sgt. F. Ruzycki; Flt. Sgt. D. E. Seeley; Act. W/O. J. Slugoski.

KILLED ON ACTIVE SERVICE.—Sgt. F. E. Gullison; L.A/C. B. Kapusta; Flt. Sgt. J. T. Lesvesque; Flt. Sgt. J. N. Mitton; Sgt. D. F. Sutterby.

### Royal New Zealand Air Force

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Sgt. A. R. Dally; Sgt. J. T. V. Gill; Sgt. H. L. Grant; Sgt. J. B. Larkins; Sgt. R. A. W. Newman; Sgt. R. E. Renton; P/O. R. J. Sotham.

MISSING.—Sgt. J. H. Beebe; Sgt. H. R. Harris.

KILLED ON ACTIVE SERVICE.—Sgt. W. E. Davies; Sgt. A. C. Dunlop; Sgt. L. S. Dyer; Sgt. P. S. O'Carroll.

DIED OF WOUNDS OR INJURIES RECEIVED ON ACTIVE SERVICE.—F/O. R. L. Brabant; Act. Flt. Lt. G. S. Taylor.

### South African Air Force

KILLED IN ACTION.—Lt. J. Symes.

KILLED ON ACTIVE SERVICE.—2/Lt. T. D. Maritz.

DIED OF WOUNDS OR INJURIES RECEIVED ON ACTIVE SERVICE.—Lt. D. H. Nicholson.

## Official Corrections

*To Casualty Communiqué No.* 221.

R.N.Z.A.F., under "MISSING," delete F/O. S. A. H. Short.

*To Casualty Communiqué No.* 222.

Under "MISSING," delete P/O. A. J Burton, Sgt. J. W. T. Duffield, and Sgt. A. G. Rusling.

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